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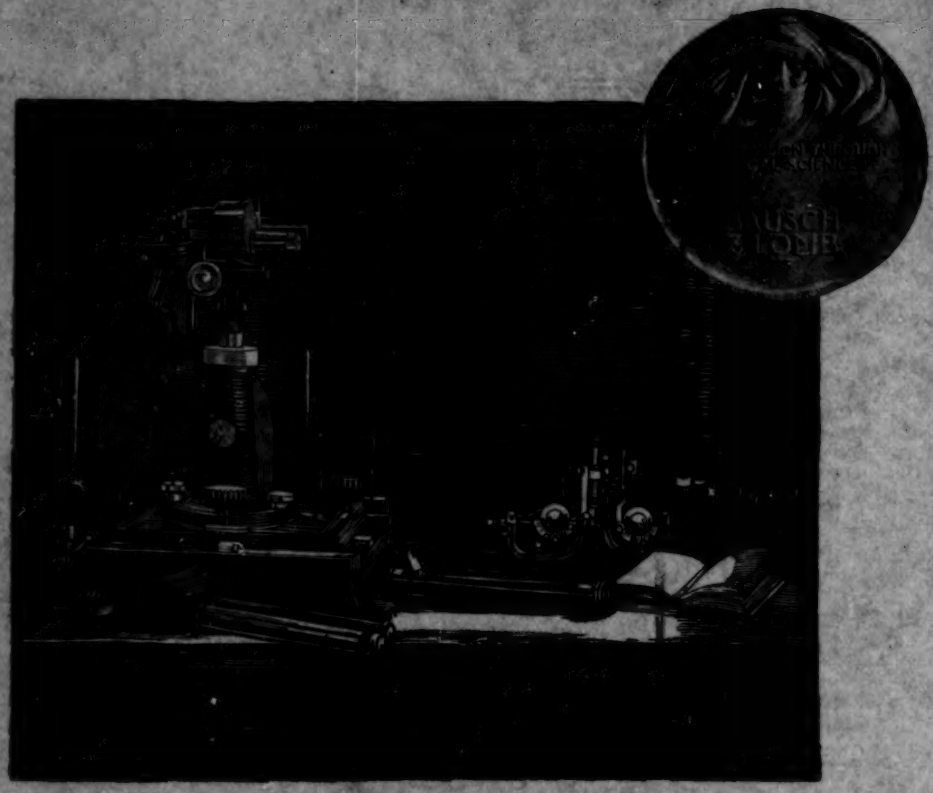

Man's Eyesight Measured That Science May Protect It

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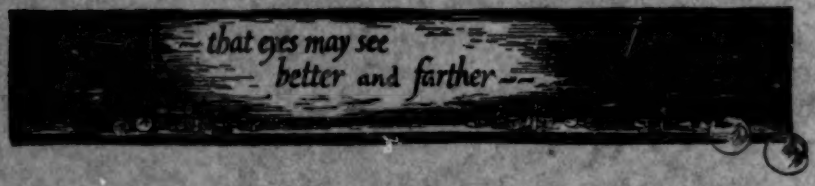


AMERICAN JOURNAL OF OPHTHALMOLOGY

Vol. 4 SEPTEMBER, 1921 No. 9

RADIUM PLUGS FOR THE DISSOLUTION OF ORBITAL GLIOMATOUS MASSES DEVELOPING AFTER EXCISION OF THE GLOBE.

BURTON CHANCE, M.D.

PHILADELPHIA, PA.

In the case of bilateral glioma here reported after enucleation of each eyeball the growth recurred in the orbit. Vigorous treatment with radium was followed by shrinking of the tumors and apparent cure, which continued after four months. Read before the American Ophthalmological Society, June 15th, 1921.

At the meeting of this Society, in June, 1920, in commenting on the reports of cases of bilateral glioma, I cited an instance of that malady occuring in a child under three years of age, who was succumbing, apparently, to the effects of the disease. The case was spoken of then because it was my desire to record an instance of the bilateral manifestation of the affection, and because it was feared the little sufferer could not survive even until I could visit him again, and therefore no further note of his case might be made. The child is alive today; in the autumn I excised his two eyes. Following the excision of the left globe the orbit became filled with a tumor mass. The orbit is now empty, and it is of the manner in which the orbit was relieved that I wish to speak especially.

In August, the profoundly cachectic child was brought to me suffering much pain; the two eyes being filled with the yellowish masses so commonly seen. By the middle of September these seemed ready to burst the globes. By the middle of October the enormously distended right globe protruded between the lids. It had ruptured, and, projecting thru the anterior segment was a dove-colored granular and pultaceous mass which became bloodstained at the slightest touch. Not until November 3, would the parents give consent for the removal of the globe; they could no longer endure his agonized crying, and I was entreated to relieve the child. The eye was excised the next day.

The globe was freely movable; the tumor mass seemed not to have perforated the sclera, altho there was a small heaping of tissues as tho a mass were surrounding the nerve for a few millimeters up to the line of the cut across the nerve trunk. The orbit proved to be quite free from nodules; and, altho for several days the lids were bloodstained and edematous, a clean healthy socket has resulted.

In the meantime the progress of the disease in the left eye had begun to distend the lids and the globe protruded thru the fissure. I expected, or at least hoped for rupture of the anterior segment of the globe as had happened in the right. However, on November 20, the whole orbital swelling suddenly subsided, and the globe positively sunk into the depth of the orbit; it was clear that it had ruptured posteriorly. By November 25, the contents had begun to distend the globe again; already the intraocular growth had pushed the lens forward abolishing the anterior chamber, and the orbit and the lids were edematous.

On November 27, this globe was removed, but with difficulty because of nodular enlargement. An examination showed that masses extended from protrusions thru the sclera which had burst out at the temporal aspect of

the globe and filled the apex of the orbit. The nerve did not seem to be involved, as was apparently the case with the right eye, altho the stalk was edematous and thick.

The reaction which followed was severe; the lids continued ecchymotic and edematous for ten days; yet after the excision, the vitality of the child revived remarkably. Almost immediately he became stronger; his skin pliant, his hair glossy, his cheeks plump and rosy, and he had ceased his fitful crying.

His case went along uneventfully until about the middle of January, 1921, when it was discovered that the left orbit was filling up. Early in February the mass extended beyond the ridges, pushing the lids forward. On the 10th I requested Dr. W. L. Clark to employ radium for the dissolution of the mass in the manner I had known him to have used it in neoplastic growths which were unfit for surgical excision, as I did not wish to attempt the exenteration of the orbit. Into the mass on the left he inserted deeply nine large plugs, or "needles," containing radium, and, into the presumably unaffected tissues on the right, as a matter of precaution, he inserted five smaller and one large needle. These were retained for 20 hours. On the 12th of February the child was taken home from the hospital, as he could be cared for well enough at home.

The immediate reaction was intense. There was distinct erythema of all the lids which lasted a number of days. For several weeks the lids on the left were puffed; a more or less ichorous discharge, which at no time was offensive, came from the left orbit; yet, while the right lids were much irritated, there was no discharge from that orbit. By May 1, the swelling of the lids of the right had subsided entirely and the socket appeared to be free from any irritation. The left lids were still faintly edematous and a thin discharge continued to flow; the cavity, however, was as deep as that of the right. In neither cavity is there now anything unusual; the mucous surfaces have assumed the smoothness commonly supervening on the healing after excision of the globe. There appeared to have been only a dissolution; or, might one speak of it as, an involution of the orbital mass. Once the child was brought because of great distension of the lids which had been caused by the retention of the fluid, which immediately subsided when drainage was reestablished by the daily separation of the lids and the more frequent use of lotions.

There have been thus far no signs of metastases. The cervical, the parotid and the submaxillary glands are none of them enlarged, indurated or painful. The child has gained in weight and grown in height. His intelligence and interest in his toys and play, and in the events of the day as read to him out of the newspaper by his father evince a somewhat extraordinary precocity. He has an elder brother and a sister, and a younger sister born since he came under my observation; the eyes of all are healthy.

I regret that I cannot make a report of the pathologic study of the excised globes. On the day a few sections were cut of one segment of the right globe, the specimens were lost in the laboratory. A week ago one half of each globe was recovered, too late for me to prepare them for exhibition. The stained sections show typical glioma cells with numerous rosettes in the fields.

The plugs, or "needles," as they are called which were used are hollow, noncorrosive, nickel-steel cases, each 20 to 25 mm. long and 2 mm. thick, roundish with a tapering point, and an "eye," thru which thread can be passed and knotted to withdraw it easily and to prevent loss of the costly implement. Each contained 10 mg. of radium sulphat, a half mm. space existing between the radium and the casing. The parts of the implement are carefully welded and polished so that no leaking or corrosion with resultant loss of the radium can occur. Broken "eyes" can be replaced without damage to the radium.

The needles were forcibly inserted their full length directly into the soft tissues, separated a few mm. from each other, and one transfixed the mass. A special forceps-like applicator was used altho a small pointed hemostat might have served.

Radium emanations were employed in this manner a few years ago, but their use was abandoned because of the uncertainty of their power and the violence of their effects. It is well known that the radium substance emits what are called beta rays and others which are called gamma rays, and on living tissues these different rays have different effects. And further, there are variations in the powers of the qualities of the individual classes of rays. The "hardest" of the gamma rays are very penetrating, and they exert a powerful action on malignant cells, while the "softer" rays are effective where slow prolonged cell inhibition is desired. The difficulties attending the use of radium in metal containers have been greatly overcome by the composition of the metal employed in the hollow slender plugs which Dr. Clark has used for a number of practitioners in Philadelphia. These, as already stated, are composed of nickle-steel, which besides being noncorrosive, filters out the harder and the more deeply penetrative rays.

By the deep insertion of these "needles," containing from five to ten milligrams of radium sulphat, into malignant growths such as the orbital masses spoken of in this report, the actions are more efficacious than can be obtained by capsules or plaques. The emanations can be used more accurately and in a smaller quantity than by the employment of a larger quantity, applied to the outside or inserted in capsule form into the tissues thru an incision. Moreover, in the use of such metallic needles; the entire quantity of radium is utilized in the tissues, whereas when radium is applied from the outside in capsules or plaques more than one half of the radioactivity is dissipated in the air.

It has been the experience of all of us frequently to find rapid proliferation and metastasis after surgical removal of masses in the orbit, following excision of a gliomatous globe. I have not seen a child recover, nor one live so long as this child has, when the orbit had been invaded; and in my experience, wide extension of the disease and painful death have always followed exenteration of the orbital cavity only too soon.

This history is not in anyway more striking than what, perhaps, might have been repeated in the experience of anyone of the Fellows of this Society. I have used the details only as a text upon which to build up a plea for the prompt employment of a remedy which can be used with every hope that the extension of so deadly a disease, as that which follows the proliferation of the neuroepitheliomata, shall be checked and life prolonged.

ELECTRICALLY TINTED OPTICAL GLASS.

SIDNEY L. OLSHO, M.D.

PHILADELPHIA.

This describes a method of giving optical glass definite protective power against ultraviolet radiations.

Optical Lenses are electrically tinted in an apparatus perfected by the Rosenthal Electric Laboratory.

American Optical Glass so treated assumes an amber tint the depth of which is increased in direct ratio to the distance, degree and time of the exposure.

The lenses are treated, after they have been ground and completely finished. Unlike ordinary tinted glasses these present clear edges, and an even color thruout, regardless of variations in thickness. A strong minus lens is not darker at the periphery nor is a strong convex lens darker at its centre. One-piece and fused bifocal lenses may have their reading portions left colorless. New or old lenses may be treated. The effect is permanent under ordinary conditions but may be removed by a high degree of heat. The refractive index remains unchanged.

THE PROCESS: A transformer raises the street current to the required voltage. Carefully insulated, it is conducted within a lead enclosed cabinet, housing a specially constructed hot cathode tube. Under the tube is a circular conveyor. On this are distributed numerous small rotating platforms each to carry a lens. The lens is conveyed beneath the tube and rotates as it is treated.

The tube is of extremely high vacuum. It shows no color when a high tension current (70,000 V.) is passed thru it.

The anode is cooled constantly by running water. The cathode is a filament of tungsten which is heated to incandescence by a low voltage current. The incandescent filament throws off electrons which impinge with great velocity upon the surface of the anode. A new energy, light, of very short wave length, is produced and penetrates objects of great density, in this case, the lenses. The latter may be said, therefore to be treated by a form of light.

There are two meters, one on the switchboard, a second on the apparatus. The distance of a lens from the tube is under micrometer control. An automatic timing device regulates the length of a treatment. Results can be duplicated and colors matched.

The samples submitted for study to the Bureau of Standards were plane lenses, 2 mm. thick, of Bausch and Lomb Crown glass. They were treated 1½ inches from the source of energy.

SCHEDULE.

20 M.A. 70 KV 6 minutes=Shade A
20 M.A. 70 KV 10 minutes=Shade B
20 M.A. 70 KV 20 minutes=Shade C

"The transmission thruout the ultraviolet and visible spectrum of three samples of this glass is shown by the curves on the accompanying chart.

For comparison purposes, the transmission of a sample of colorless crown glass, (1.68 mm. in thickness) is shown on the same graph. A study of these in connection with those given in Bureau of Standards Technologic Paper No. 119* will afford a direct comparison of the protective properties of this glass and other glasses reported on in that paper."

The transmission curve shows absorption to be greatest at the violet end of the spectrum. The curve is continuous in the visible spectrum, hence color values are undisturbed. The Relative Visibility curve is cut almost straight across, hence there is an even reduction of the intensity of light reaching the eyes.

There is a disproportionate absence

*Bureau of Standards Technical Paper No. 119. A study made at the request of the Committee on Hygiene of the Eye of the Section on Ophthalmology of the A. M. A. See also A. J. O., v. 3, p. 688.

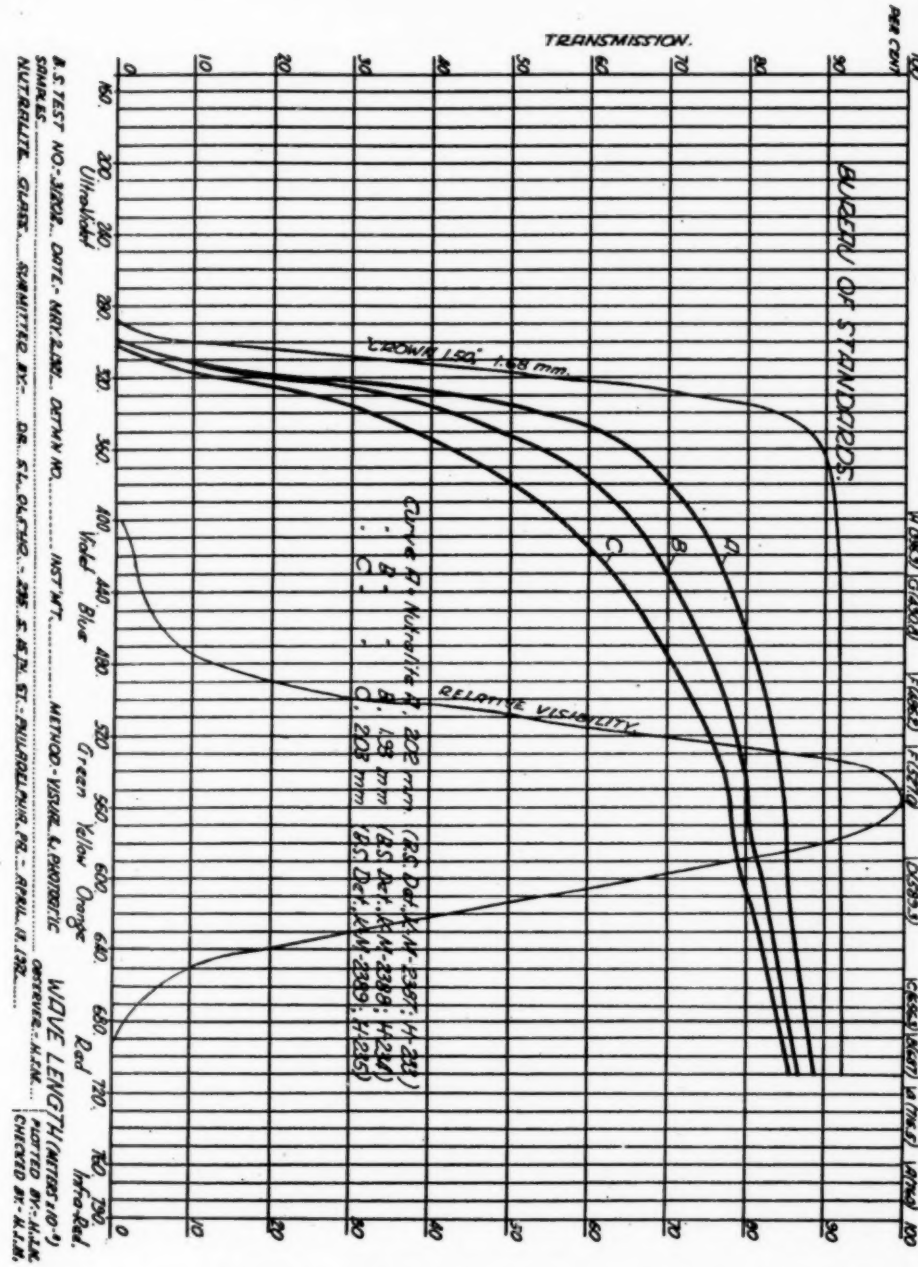

SPECTRAL TRANSMISSION.
BUREAU OF STANDARDS.
TRANSMISSION.
PER CENT
FRAUNHOFER LINES.
W (396.9) G (430.8) F (486.2) E (527.0) D (589.3) C (656.3) A (760.8) B (686.7)
CROWN 1.50 1.68 mm.
A
B
C
RELATIVE VISIBILITY
Curve A, Nutralite A. 2.02 mm (B.S. Det. No. H-237; H-231)
" B. " " B. 1.98 mm (B.S. Det. No. H-238; H-234)
" C. " " C. 2.03 mm (B.S. Det. No. H-239; H-235)
Ultraviolet
Violet
Blue
Green
Yellow
Orange
Red
Infra-Red.
WAVE LENGTH (METERS × 10⁻⁹)
B.S. TEST NO.:- MIRROR... DATE:- MAY 2, 1932... DETAIN NO.... INST'N'T.... METHOD:- VISUAL & PHOTOELECTRIC
SAMPLES.
NUTRALITE... GLASS... SUBMITTED BY:- ... DR. S.L. OLATARD. ... 235, S. 46TH. ST., PHILADELPHIA, PA. ... APRIL 11, 1932.
PLOTTED BY:- M.J.K.
CHECKED BY:- M.J.K.

Chart showing transmission curves of three shades of electrically treated crown glass, as measured by the Bureau of Standards.

of visible color when the lenses are worn. No idiosyncrasy against uncolored lenses develops.

If German Optical Glass is subjected to this treatment it develops an amethyst cast. It then resembles the amethyst, sun-tinted, old window glass, the useful properties of which were described by Dr. L. Webster Fox, (J. A. M. A. 7-10-1909).

Fox predicted that an electrical method would some day be devised so that optical glass, which is more perfect and better than window glass could be quickly tinted. He has persistently claimed that the ordinary amethyst lenses, as found on the market, are entirely different and inferior to lenses amethyst-tinted by the action of sunlight.

In turn it is claimed that American Optical Glass electrically tinted amber, is superior to German Optical Glass, electrically tinted amethyst.

PROTEIN IN THE TEARS AND INNERVATION AND SECRETION OF THE LACRIMAL GLAND.

C. F. CHARLTON, M.D.

PASADENA, CALIFORNIA

This continues the discussion begun in a previous paper (A. J. O., v. 3, p. 802). The recent researches of J. Loeb are reviewed in confirmation of the action of protein content of the tears. The similarities of the innervation and secretion of the lacrimal and parotid glands are pointed out; and the views here expressed are applied to the better understanding of the etiology of xerophthalmia.

Jacques Loeb[1] has shown conclusively that the hydrogen ion concentration of a protein determines its reaction with acids, bases and neutral salts, while at a certain concentration there is no reaction. This is called the iso electric point. On the alkaline side of the iso electric point the protein reacts as an acid forming metal proteinates, while on the acid side of the iso electric point, the protein unites with the anion forming the protein salt. With neutral salts the same reactions occur, taking the cation in the first instance and the anion in the second.

It has been recognized for some time that van't Hoff's idea of applying the law of gases to the phenomenon of osmosis did not hold good for solutions of electrolytes. That is, that the process could not be explained purely on the basis of molecular concentration; and we are indebted to Loeb also for illumination on this subject.

He finds when water moves thru a collodion membrane attracted by an electrolyte in solution, it develops an electrical charge. This electrical charge in the case of a pure collodion membrane is usually positive and the attractive force resides in the negatively charged ion or the anion of the electrolyte. The attraction of the anion diminishes with concentration and the repulsion of the cation increases. The electrostatic forces are more nearly balanced in the higher concentrations, and further curves of attraction simulate those of nonelectrolytes in accordance with van't Hoff's idea.

Now if a protein film is interposed on this membrane, the behavior is completely modified in accordance with the H ion concentration of the protein. When the H ion concentration exceeds a certain limit (iso electric point) the water assumes a negative charge, but on the alkaline side the water has a positive charge. The iso electric point of serum globulin is at the p H 5.52, of serum albumin at the p H 4.7. The p H of whole blood is 7.2-7-7, so we may say the normal state of the plasma proteins is on the alkaline side of their iso electric points. The p H of tears, I find to be about 7.2. When a tissue protein is exposed to atmospheric pressure, as is the protein film on the cornea, its alkalinity increases with the escape of the $C O_2$.

Loeb finds the swelling at a minimum at the iso electric point and an increase in the alkalinity increases the swelling within certain limits. It is safe to assume we are dealing within this limit in this case.

Loeb reports salts to have a depressing effect on the viscosity and swelling of proteins, while I reported an initial depression or retardation by 1.4% salt solution on the swelling of egg white with a subsequent augmentation. Since learning of Loeb's findings, I have repeated my swelling experiments many times and I herewith record findings confirming the original and amplified by contrasting normal salt with 1.4%.

Containers are eggs with the shell removed from the large end leaving the membrane intact. An opening is made on the small end to empty the contents. 5 cc. of egg white were then put in the egg membrane and egg shells placed in a wine glass containing the water or salt solution. The containers were tested for leakage

both before and at the conclusion of the experiment.

5 c.c. container A (control) dist. water	5 c.c. container B dist. water	5 c.c. B .7% Na-Cl	5 c.c. B 1.4% Na.Cl	Time
	1	2	3	
1- 7.5 c.c. 2- 7.5 c.c. 3- 7.5 c.c.	7.0 c.c.	6.0 c.c.	6.0 c.c.	after one hour
1- 9.5 c.c. 2- 9.5 c.c. 3- 9.5 c.c.	9.0 c.c.	6.5 c.c.	8.0 c.c.	" two "
1-13.0 c.c. 2-13.0 c.c. 3-13.0 c.c.	10.5 c.c.	7.5 c.c.	10.0 c.c.	" four "
1-15.0 c.c. 2-15.0 c.c. 3-14.5 c.c.	12.0 c.c.	9.0 c.c.	12.0 c.c.	" six "
1-25.5 c.c. 2-25.5 c.c. 3-24.0 c.c.	20.0 c.c.	15.5 c.c.	20.0 c.c.	" 24 "

The control A contained white from the same egg in each series as B, and checks up variations in its swelling, but is seen to be very uniform; and while it slowed up in the 3rd series, this slowing is in favor of the conclusion in regard to salt action.

Egg white of course contains several proteins, but is particularly suitable in that they are for the most part of the simple variety and behave like those of the blood. Of course, this influence of the salt may be an expres sion of the behavior of the globulin like protein, and it is very important to know more of this property of globulins if this be so, since globulin predominates in plasma.

The lacrimal gland possesses a double innervation like the salivary glands and herein lies the explanation of the dual nature of the glandular secretion in (1), a thick viscid protein fluid and (2) tears. Like the parotid, which receives its central nerve supply from the glossopharyngeal by way of the auriculotemporal branch of the fifth nerve, the lacrimal gland also receives its central innervation from the glossopharyngeal. The fibers are carried in the facial to the geniculate ganglion thence to the sphenopalatine ganglion by the great superficial petrosal nerve. From here they turn back in the second division of the trigeminal to the Gasserian ganglion, and go forth in the first division of the trigeminal to reach the gland. It also has a sympathetic innervation[2].

In the case of the salivary glands stimulation of the nerves, coming from the brain (chorda tympani to the submaxillary and auriculotemporalis to the parotid), causes a vascular dilatation and the abundant secretion of a watery fluid. The character of the secretion is changed to a thick viscid consistency when the sympathetic is stimulated[3]. The same very likely is true of the lacrimal gland and explains the highly watery nature of tears and the thicker protein fluid ordinarily secreted. Stock[2] states that facial paralysis above the geniculate ganglion causes a suspension of weeping, but the moistening of the eye is unimpaired. This clinical observation supports the analogy.

The protein content of the lacrimal secretion has considerable practical application in the nourishment of the anterior layers of the cornea. The condition xerophthalmia, recently extensively reported by Osborne[4], Mendel[4] and Wason[4], is relieved by feeding the fat soluble vitamin, or substances such as butter and cod liver oil. This disease is possibly much more frequent in man than we suppose. Its timely recognition is vital to preserve vision. Heine[5] states it clears up like magic when fat and protein are included in a nourishing d i e t. Neglected, it leads to ulceration (marantic ulcer); and Wason[6] from her pathologic studies states "The degree to which restoration is possible depends on the extent of the secondary injury."

Speculation as to why certain fats relieve this condition leads us to the fact that serum globulin, the predominating plasma protein, is precipitated linked with a lipin. Possibly then the chemical structure of the fat, when absorbed, is such that it is able to mobilize the globulin and bring it into the circulation*. Epstein[7] reported an exceptional lipin content of

*Further investigations indicate that an action of vitamins is to alter the colloidal state of proteins whereby they become available to the cells of the tissues in question.

the blood in chronic parenchymatous nephritis, associated with an increase of serum globulin. The writer has noted a profuse lacrimal secretion in the same disease and the greasy appearance is unmistakable. Fuchs[8] speaks of greasy islands on the conjunctiva in his description of xerophthalmia indicating insufficient secretion to cover the entire surface.

BIBLIOGRAPHY

1. Loeb, J. Ion Series and The Physical Properties of Proteins. Jour. Gen. Physiol., Sept. 20, Nov. 20, 1920, and Jan. 20, 1921.
   Proteins and Colloid Chemistry. Harvey lecture, Science, Nov. 12, 1920.
   Electrification of Water and Osmotic Flow. Science, Jan. 27, 1921.
   Hydrogen Ion Concentration Data from Walpole. Mathews' Physiological Chemistry, 3rd Ed., p. 545.
2. Stock, W. Lehrbuch u. Atlas der Augenheilkunde. Axenfeld, 6th Ed., p. 296.
3. Mathews. Physiological Chemistry, 3rd Ed., p. 321.
4. Journal A. M. A., April 2, 1921.
5. Heine, L. Lehrbuch u. Atlas der Augenheilkunde. Axenfeld. 6th Ed., p. 171.
6. Mathews. Physiological Chemistry. 3rd Ed., p. 553.
7. Epstein. Nature and Treatment of Chronic Parenchymatous Nephritis. Jour. A. M. A., August. 11th. 1912.
8. Fuchs. Text Book of Ophthalmology. Duane. 6th Ed., p. 220.

SENILE CATARACT EXTRACTION.

WALTER R. PARKER, M.D., F.A.C.S.

DETROIT, MICHIGAN.

This is the report of a comparative study of results obtained in 1,421 cataract operations performed in the author's private practice and the ophthalmic clinic of the University of Michigan. Presented to the Section on Ophthalmology of the American Medical Association, June, 1921. Published here by courtesy of the Journal of the A. M. A.

This report includes the results that I have obtained from operations for the extraction of senile cataracts in my private practice, together with those performed in the ophthalmic clinic of the University of Michigan from October, 1905, until January, 1921.

An attempt will be made to compare the results obtained by the various methods employed; and finally some of the more important features of the operation will be discussed.

In all, 1,421 operations were performed. The methods employed, together with the number of operations in each group, were: combined extraction, 1,013; simple extraction, 156; Knapp operation, 49; Indian operation, 91; after trephine operation for glaucoma, 8, and after preliminary iridectomy, 104, or a total of 1,421 operations.

In Table 1 is shown the total number of operations performed by various methods, together with the visual results obtained and the number and percentages of cases of loss of vitreous and the number and percentage of infections. The results are not classified as success, partial success or failure, but by the visual acuity obtained in each case as recorded.

These records of visual acuity are not accurate expressions of the results obtained. Many of them are the initial records made about two weeks after the operation was performed, while others are the final records, which in almost every instance were better than those first made. As the same discrepancy obtained in all the tables, however, a rough comparison may be permissible.

It is to be regretted that such a large number of cases must be tabulated as "not recorded." This is due in part to the fact that patients sometimes leave the hospital without reporting for refraction, and in part to an occasional incomplete record. From a record standpoint, this is especially unfortunate, as only the patients whose cases are most successful leave, while those with postoperative complications always remain.

It would be much more definite to tabulate results surgically, irrespective of visual results obtained.

TABLE 1.—VISUAL RESULTS OBTAINED WITH VARIOUS OPERATIONS.

			Combined Operation											
6/4 4	6/5 33	6/6 64	6/7½ 86	6/9 84	6/12 145	6/15 96	6/20 94	6/40 93	6/60 97	Less Than 6/60 111	Not Recorded 105	Loss of Vitreous 109 10.7%	Infected 5 0.48%	Total 1,013
			Simple Operation											
1	10	5	12	15	16	10	16	25	12	10	24	10 6.4%	2 1.2%	156
			Knapp Operation											
..	1	6	6	8	8	1	4	2	6	6	1	5 10.2%	0	49
			Indian Operation											
1	3	6	6	8	14	6	12	9	8	13	5	18 19.7%	1 1.1%	91
			Preliminary Iridectomy											
0	0	4	3	3	8	8	5	3	7	38	25	10 9.6%	2 2.6%	104
			After Trephine Operation for Glaucoma											
..	..	..	..	1	..	1	2	..	..	2	2	0	0	8
Total.....														1.421

LOSS OF VITREOUS.

All cases in which there was even a slight loss of vitreous are included in this report. The percentage of cases recorded in each of the various methods of extraction in which there was a loss of vitreous is given in Table 2.

It will be noted that loss of vitreous occurred more often in the Indian operation than in any other method of extraction (19.7 per cent), while the loss in the Knapp operation was slightly less than in the combined, from 10.2 to 10.7 per cent. The number of combined operations was much greater, however, 1,013 to 49 Knapp operations. The percentage of loss of vitreous for the total number operated on was 10.1 per cent.

TABLE 2.—PERCENTAGE OF CASES RECORDED WITH LOSS OF VITREOUS.

Type of Operation	Number of Operations	Number of Cases	Loss of Vitreous, per cent
Combined	1,013	109	10.7
Simple	156	10	6.4
Knapp	49	5	10.2
Indian	91	18	19.7
Preliminary iridectomy	104	10	9.6
After trephine operation for glaucoma	8	0	0.0

INFECTIONS.

The percentage of cases recorded for each of the various methods of extraction in which infection took place is recorded in Table 3.

The percentage of infection for the total number operated on was 0.7 per cent.

TABLE 3.—PERCENTAGE OF CASES IN WHICH INFECTION TOOK PLACE.

Operation	Number	Per Cent
Combined	5	0.48
Simple	2	1.2
Knapp	0	0.0
Indian	1	1.1
Preliminary iridectomy	2	2.6
After trephine operation for glaucoma	0	0.0

In one of the cases in which a preliminary iridectomy was performed, there was a history of an old iridocyclitis. The eye had a subnormal tension, and the iris was bound down. It is possible that as a result of the operation, an old inflammatory process was lighted up and no new infection had occurred. As this could not be definitely determined, the case is included in the report as having been infected at the time of operation.

BACTERIOLOGY.

As two of the cases of panophthalmitis occurred before the time when a routine bacteriologic examination was carried out, the records are not complete in this regard. The findings in the cases examined were as follows: *Staphylococcus albus*, 2; staphylococcus and streptococcus, 1; xerosis and streptococcus, 1; pneumococcus, 2; Morax-Axenfeld, 1; reported negative, 1, and not examined, 2.

An effort was made to determine, if possible, the number of cases in which the visual acuity of less than 6/60 was due to postoperative complications, or faulty technic. To determine this, the

TABLE 4.—ACCIDENTS AND PATHOLOGIC CONDITIONS TO BE DEDUCTED.

	Combined Operation	Simple Operation	Indian Operation	Preliminary Iridectomy	Knapp Operation	After Trephine
Injury by patient	11	1	..	..	..	..
Vitreous opacities	26	1	1	6	2	..
Retinal detachment	6	..	2	1	1	..
Intraocular hemorrhage	4	..	..	..	..	..
Chronic uveitis	5	..	..	1	..	..
Chronic glaucoma	8	1	..	23	..	2
Corneal opacities	11	1	..	..	..	..
Optic atrophy	2	..	..	..	..	..
Choroiditis	2	1	4	1	2	..
Organized vitreous	2	..	..	1	..	..
Hemorrhagic retinitis	3	..	..	..	..	..
Atrophic eye	..	..	..	1	..	..
Amblyopia	4	..	..	..	..	..
Retinitis pigmentosa	2	..	..	..	..	..
Intractable patient	2	..	..	..	..	..
Totals	88	5	7	34	5	2

number of cases in which a known pathologic condition or accident could account for the loss of vision was deducted from the total number recorded as less than 6/60.

Table 4 shows the number of accidents and pathologic conditions to be deducted from the number recorded as "less than 6/60" in each method of extraction.

The number of failures in cases recorded as less than 6/60, due to postoperative complications or faulty technic, is given in Table 5.

TABLE 5.—FAILURES DUE TO POSTOPERATIVE COMPLICATIONS OR FAULTY TECHNIC.

Operation	Vision Less Than 6/60	Accidents Known Pathologic Condition	Failure in Cases Recorded as Less Than 6/60 Due to Postoperative Complications or Faulty Technic	
			Number	Per cent
Combined	111	88	23	2.2
Simple	10	5	5	3.2
Knapp	6	5	1	2.1
Indian	13	7	6	6.5
Preliminary iridectomy	38	34	4	3.7
After trephine operation for glaucoma	2	2	0	0.0

It will be noted that in the Indian operation there was the highest percentage of failures, 6.5 per cent, in the Knapp operation the least, 0.2 per cent, and in the combined operation, 2.2 per cent. It must be mentioned that the patients on whom the Knapp operation was performed were all carefully selected, while those subjected to the combined operation included all who were unfit for any other procedure, except perhaps a preliminary iridectomy. The number of failures that resulted from the simple operation and from the preliminary iridectomy was about the same, being 3.2 per cent in the former, and 3.7 per cent in the latter.

A comparison of the various methods of extraction as regards both loss of vitreous and number of failures in cases recorded as less than 6/60, due to postoperative complication or faulty technic, is given in Table 6.

From this comparative study, it appears that in the Indian operation, there was a higher percentage of loss of vitreous and of failures due to accident and postoperative complications than was shown in any of the other methods employed. In the combined operation, there was the least percentage of failure due to accident or postoperative complications, while in the simple operation there was the smallest number of cases of vitreous prolapse. These percentages refer only to cases recorded as visual acuity less than 6/60, and not to the total number in which operation was performed.

TABLE 6.—COMPARISON OF VARIOUS METHODS OF EXTRACTION.

Operation	Loss of Vitreous		Failure in Cases Recorded as Less Than 6/60 Due to Postoperative Complications or Faulty Technic	
	No.	Per cent	No.	Per cent
Combined	109	10.7	23	2.2
Simple	10	6.4	5	3.2
Knapp	5	10.2	1	2.0
Indian	18	19.7	6	6.5
Preliminary iridectomy	10	9.6	4	3.7

While no attempt will be made to give all the complications that were encountered in this series of cases, a few of the more unusual ones will be mentioned, simply as a matter of record.

EXPULSIVE HEMORRHAGE.

There were three cases of expulsive hemorrhage, 0.21 per cent. This complication occurred in patients with advanced arteriosclerosis with high blood pressure. But there was no indication that a hemorrhage was more likely to occur than in any one of a large number of patients with equally severe symptoms on whom a similar operation was successfully performed. Whether or not hemorrhagic retinitis existed at the time of operation could not be determined.

CATARACT DELIRIUM.

Thirty-three cases of cataract delirium occurred in 1,421 extractions, 2.3 per cent. Of this number twenty-seven were males, and six were females. The average age for both sexes was 72. The youngest male was 51, and the oldest 81; the youngest female, 62, the oldest, 82. A history of alcoholic excess was given in eleven cases, 33.3 per cent.

DETACHMENT OF THE CHOROID.

Detachment of the choroid was noted in six cases, but as no careful study was made of the interior of the operated eye until the time of discharge from the hospital, this number does not in any way indicate the frequency of this complication. In all cases noted, with one exception, spontaneous reattachment took place. One patient was lost to observation before reattachment occurred.

COMMENT.

The combined operation with a conjunctival flap was performed more than twice as many times as were all the other operations taken together, and I regard it as the most satisfactory method of procedure in all but specially selected cases.

Unfortunately, the records were not complete as regards the number of times the iris prolapsed in cases of simple extraction.

A special study of a series of cases was made to determine the relative frequency of prolapse, with or without the use of atropin, before the time of operation. The results are given in Table 7.

TABLE 7.—FREQUENCY OF PROLAPSE IN CASES OF SIMPLE EXTRACTION.

Number of Cases	Without Atropin		Number of Cases	With Atropin	
	Number	Per cent		Number	Per cent
47	5	10.8	49	2	4.1

Since making this test, atropin is instilled routinely the night before the day of operation and repeated after the operation is completed, unless there exists some contraindication for its use.

The simple extraction was performed in young patients and in selected senile cases, in which the cornea was large and the iris well dilated.

The patients in whom the iris was left intact were examined on the day following the operation, and if a prolapse was present, an iridectomy was performed at once, no attempt being made to replace the iris.

That the Indian operation can be successfully performed in certain cases there can be no doubt. But when complications arise, they are often of such a serious nature as to force many to the conclusion that the combined operation is a safer procedure to follow. I fully agree with Knapp, who came to the conclusion that "the lens cannot be dislocated by external manipulation alone, without in many instances subjecting the eye to greater pressure than seems wise."

After an experience comprising ninety-one extractions by the Indian method, I am convinced that in my hands the older operation, as a routine procedure, gives better results. To quote what I have said on a previous occasion, "This conclusion was reached, not after one attempt, but after several honest endeavors had been made to determine the relative merits of the two procedures, renewed efforts being prompted by the glowing reports of the enthusiastic adherents to this method of extraction."

The traction method of extraction as described by Knapp and Török, seems to offer the best method of extracting the lens in its capsule. It is safer than the Indian method, in that if the capsule is ruptured, the lens can be delivered in the ordinary way. The risk of loss of vitreous is less, and a distorted pupil or disturbance of the anterior vitreous rarely occurs. Thus the three cardinal complications of the Indian operation are minimized.

In this series, an attempt was made seventy-seven times to deliver the lens in its capsule by traction, and was successfully accomplished forty-eight times, 62.3 per cent. Vitreous was lost five times, 10.2 per cent. In six cases the resulting vision was below 6/60. In five of these cases there was a pathologic explanation, while in one case the failure was due to postoperative iridocyclitis. Of the five cases, two patients had dense vitreous opacities, one detachment of the retina, and two showed an advanced choroiditis. The iridocyclitis occurred in a patient, aged 51. This was the only attempt made to extract the lens in its capsule by traction in a patient below 60 years of age.

In order to make a comparative study of the visual results obtained in

cases of extraction after the Knapp method, an equal number of consecutive cases in which operation was performed by the combined method was taken for comparison. A second refraction was made in every case, and a secondary operation was performed if necessary. It was somewhat surprising to find that the average vision in each series was practically the same, about 6/10. In both groups, cases with any pathologic changes that could account for the diminution of vision were eliminated. There were thirty-nine cases of intracapsular extraction, and forty-one after the combined method, used for comparison. The exact visual acuity in each group was: Knapp operation, 19/30; combined operation, 21/35.

Whether or not it is wise to attempt to deliver the lens in its capsule as a routine procedure has not been fully established. Perhaps the posterior capsule has a protecting function not to be neglected. Certain it is that the fear of complications arising from performing a secondary operation after the Ziegler method is no argument in favor of resorting to any procedure that is more hazardous than the extraction with capsulectomy.

In this series of cataract extractions, a secondary operation after the Ziegler method was performed more than 200 times. While a perfect opening in the capsule was not always obtained, in not a single case, as far as could be determined, did there occur a serious reaction or after result that made the case more complicated than it was before the operation was performed.

PRELIMINARY IRIDECTOMY.

A preliminary iridectomy was performed in cases in which the cataracts were developing equally in both eyes and when a useful vision could be obtained by the use of a mydriatic, also in cases known to have fluid vitreous, or in which the operation on the fellow eye had been followed by serious inflammatory reaction, and in all cases with even suggestive symptoms of glaucoma.

I fully appreciate that the many elements which enter into the successful management of cataract cases from an operative standpoint make it difficult to record results or draw accurate conclusions. It is possible, however, that as our knowledge increases, we may be able to make a choice of procedure that will lead to better average results. But it would seem for the present, at least, that any procedure must stand the test of comparison with the combined operation performed on patients selected with equal care.

The presentation of this series has been made possible thru the cooperation of the various members of the ophthalmologic staff at the University of Michigan during my entire service, and I wish to express my sincere appreciation of their valuable assistance.

HEREDITARY PTOSIS.

T. J. Dimitry, M.D., F.A.C.S.

NEW ORLEANS, LA.

This paper reports a genealogy of five generations, thirty-eight individuals, of whom twenty-one showed blepharophimosis. It also discusses the surgical and social problems growing out of such a condition.

I wish to record twenty-one cases of hereditary ptosis observed in a known five generations. I shall not attempt to offer explanation for the occurrence of the variation, but will present clinical facts.

A review of the literature on hereditary abnormalities shows that conclusions are very often drawn from a limited number of cases and there appears a desire to have them garbed to laws of heredity. I would like to see some simple form of case report record adopted; it would act as a stimulus in the report-

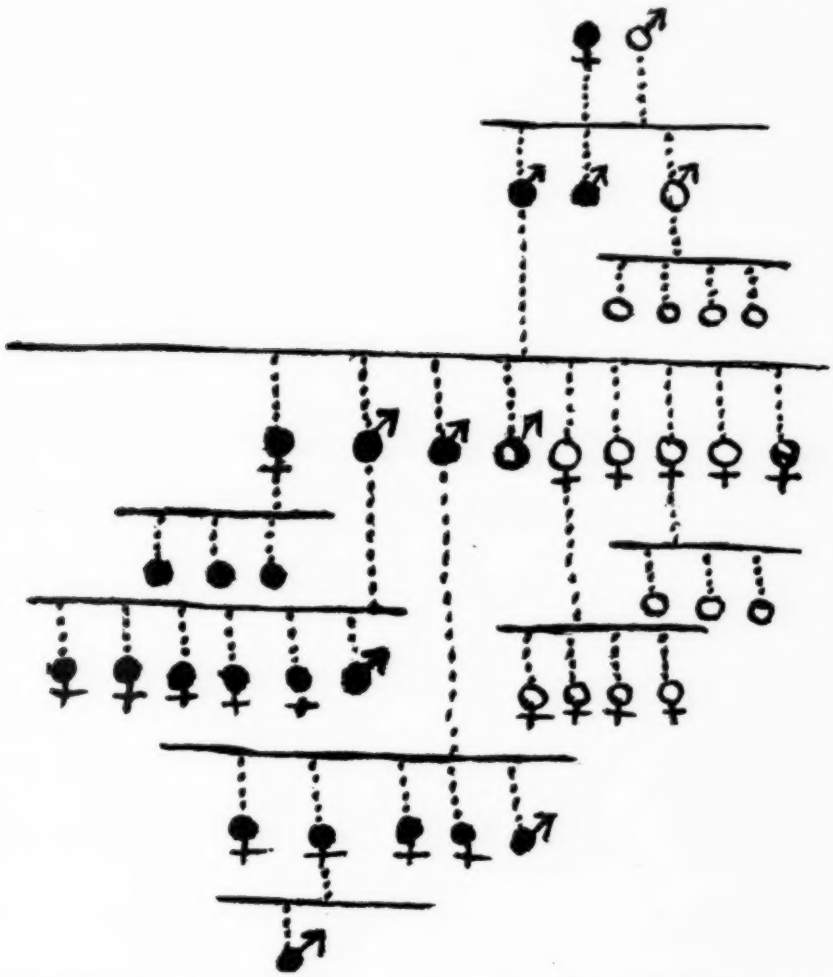


Fig. 1.—Chart showing family tree for cases of hereditary ptosis. Individuals affected are shown with a black circle, unaffected by the rings enclosing white. Females shown by cross below the circle, males by arrow point up and to right.

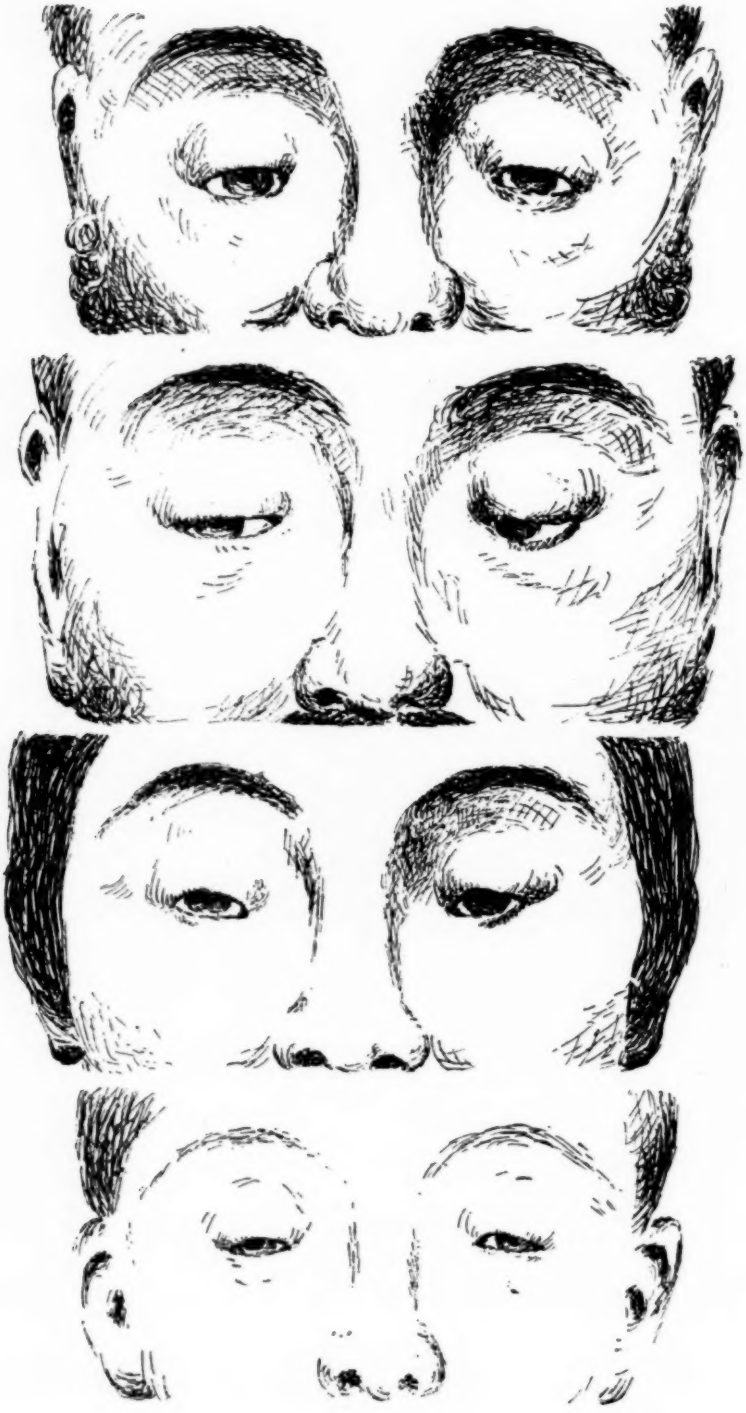


Fig. 2.—Four direct generations of hereditary blepharophimosis. (Dimitry.)

ing of many cases that are at the present time neglected.[1]

It is unfortunate that many are not familiar with the excellent work that is being carried on at the Eugenic Record Office of Cold Spring Harbor, New York. They are collecting most valuable data and I am certain will assist in any statistical investigation. That office is a department of the Carnegie Institute at Washington.

LAWS OF HEREDITY. Those writers, who affix these laws in explanation of their cases, have necessarily gained thru their research knowledge on a very interesting subject, but at best it is limited information gleaned from a mass of uncertainties. Because of these uncertainties, one is not justified, when dealing with but a few cases, in assigning them to any law.

The deductions are of little value and merely increase confusion. Since the time of Aristotle, our trained biologists have been sincere in their study of heredity; and tho they have given us much valuable information, there is still a necessity for a greater number of case reports to assist in further progress.

BLEPHAROPHIMOSIS. The title of my paper is hereditary ptosis, for under this heading it will be more readily recognized and assigned in the literature to its proper position. Blepharophimosis is the true condition, in my cases, and besides conveys a better understanding of the clinical condition. Blepharoptosis is from the Gr. *βλεφαρου*, the lids, and *πτωσις*, meaning to fall, a falling of the lids. Every condition in which the lids cannot be elevated is not due to a falling of the lids. Blepharophimosis: striction or stopping up. *φιμωσις* is a small palpebral aperture which is stretched horizontally.

CASES. The cases are considered as a whole for a description of one is true of the others. My cases are 1-2-3 and

FIG. 3.—Three of Dimitry's cases of blepharophimosis showing appearance of deformity.

[1] The Section on Ophthalmology, American Medical Association has a committee on the prevention of hereditary blindness, that is formulating a plan for its control. This committee might also include deficiencies.

4, shown in tree attached; the father, two daughters and a grandchild.

The cornea is of the usual dimensions and there is no paralysis of any of the recti muscles. Bony orbits are properly developed and of usual size. The lids cover from a third to half of the cornea. Slight elevation of lids occur when the muscles of the forehead are called into action. The palpebral apertures are small so that even by use of the fingers the lids cannot be made to uncover the cornea satisfactorily. The condition is that of a small aperture in which the lids are stretched over a properly developed bony orbit, and is constricted by its palpebral ligamentous attachment.

The problem considered ethnologically was negative. The first known member of the family was born in Syracuse, Island of Sicily. Tho the island has been overrun by many races; the Greeks, Goths, Byzantines, Saracens and the Normans, yet there is nothing in these different races which would account for the condition.

THE FAMILY TREE.—In this family genealogy of five generations there were thirty-eight living children, of which twenty-one showed blepharophimosis. The condition was not connected with sex, for there were eight males and eight females affected. The male and the female transmitted in equal numbers. It was never transmitted by a normal individual. Of the total males seven had the disease and seven had not. Sketches 1-2-3 and 4 show four direct generations. The photograph shows cases 2-3 and 6.

THE PROBLEM IN EUGENICS.—The family skeleton was the dreaded "small eyes." I was first consulted, when case three was pregnant, for information as to the chances of her expected child. As the condition was a Mendelian Dominant, I could give but poor encouragement. I could only account for it as and assign it to some particular form operating thru a particular disorder and of direct transmission.

THE SURGICAL PROBLEM.—These cases demanded that they be handled quite differently from the usual ptosis, for the condition was not simply a dropping of the lids but an undeveloped palpebral aperture. The selected operation was a canthoplasty with a tenotomy of the palpebral ligament. I have operated on cases 2 and 3 and I have obtained much satisfaction. In order to obtain an increased effect in the canthoplasty I used a sliding bridge of conjunctiva.

CONCLUSION.—These cases, twenty-one in number in five generations, showed a condition often improperly diagnosed as congenital ptosis. The true condition was that of a congenital blepharophimosis. Had the usual surgical technic been adopted in correcting it, the results would not have been satisfactory.

THE SURGICAL TREATMENT OF COMITANT AND PARALYTIC STRABISMUS.

JOHN M. BANISTER, M.D., F.A.C.S.

OMAHA, NEBRASKA.

This paper describes its author's methods of operating for each of these forms of strabismus. It was read before the Sioux Valley Eye and Ear Academy at Sioux City, January 19th, 1921.

As the title indicates, this paper will be limited to a practical discussion of the operative treatment of squint, both comitant and noncomitant, or paralytic.

In all considerations of the treatment of squint, a sharp distinction must be made between the methods of surgical procedure in the cases of comitant and paralytic deviations respectively. In comitant squint the angle of deviation remains definite and fixed in whatever direction the eyes are carried with the object of fixation at any given distance; while in noncomitant or paralytic strabismus the deviation increases or diminishes, increasing as the object looked at is carried in the direction of the action of the paretic muscle and diminishing when carried in the opposite direction.

Comitant strabismus is limited to the two forms, internal and external squint, while in paralytic strabismus the deviation depends upon what muscle, or muscles, may be paralyzed. In constant comitant strabismus of long standing, the deviating eye is in the great majority of cases defective in vision, which is the result of the mental suppression of the visual image (amblyopia ex anopsia), or is due to congenital defects, or postnatal pathology.

In paralytic strabismus there is a very definite pathology involving the nerve of supply in its nucleus, along its trunk, or in certain of its branches of distribution. This pathology must be taken into very serious consideration when planning a method of treatment

The views advanced in this paper relative to the operative treatment of strabismus are founded upon the writer's experience as an ophthalmic surgeon, extending thru many years, and will no doubt be found to be at variance in certain regards with the opinions of writers generally considered to be authorities on the subject.

1. THE SURGICAL TREATMENT OF COMITANT STRABISMUS.

As before stated, comitant strabismus is limited to the two forms, internal or convergent squint and the external or divergent variety. While the scope of this paper will require an omission of the discussion of the various theories relative to the causation of comitant squint, it must, nevertheless, be noted that as a necessary preliminary to radical surgical treatment, the static refraction must be accurately determined under cycloplegia.

The refractive correction, constantly worn, may, in certain cases, secure a satisfactory cosmetic result, especially in young subjects with a marked error of the hyperopic type; and such correction by glasses should invariably be tried before operative measures are attempted. Of course it goes without saying that along with the use of the correcting lenses the usual orthoptic methods should be made use of in advance of operation, and this applies with especial force to the treatment of the young.

In cases, however, in which all of the usual preliminary measures have been tried, and the squint still continues, operative interference is definitely indicated in patients over five years of age.

(a). The surgical treatment of internal or *convergent strabismus.*

Before operating one should determine approximately the degree of deviation with a view to establishing some estimate of the extent of the operative procedure to be undertaken. The words "some estimate" are used advisedly, for it is absurd to hold that by determining mechanically, or subjec-

tively, the supposed degree of deviation of a squinting eye, the data so obtained will enable the operator accurately to gauge the amount of operative interference required, and to judge as to the exact number of millimeters a given tendon should be advanced or set back.

In the case of the functions of the ocular muscles, we are dealing with highly complex physiologic processes, which in strabismus have become disarranged to some extent it is true, but which, nevertheless, are to be taken into careful consideration.

Thus, while in the case of one patient with an inward deviation of seemingly 20° (about 40 mm. linear measure), a careful complete tenotomy of the internal rectus muscle may secure a perfect cosmetic result; in another individual under exactly similar conditions, as far as can be determined, only a comparatively moderate change in the angle of convergence may result from the same operative attempt. The ophthalmic surgeon, in fact, cannot operate upon hard and fast lines in his strabismus cases, but must consider every patient a law unto himself and must be prepared to meet unexpected conditions as they may arise. Given a case of convergent strabismus, upon which operation is indicated, the following method of operating is advised:

Under local anesthesia, which is indicated in all patients over fifteen or sixteen years of age, a very careful complete tenotomy of the internal rectus muscle of the squinting eye, close to the sclerotic insertion, is performed. The separation of the tendon from the globe at this point must be complete, all strands of muscular tissue being divided with as little interference with the relations of the muscle to Tenon's capsule as possible. Any such interference as clipping the connections of the muscle to the capsule is to be condemned.

If, after such a carefully performed tenotomy, the cosmetic effect desired has been obtained and the internal rectus muscle is found to have preserved its control over the globe, the operation may be considered satisfactorily performed, and there orly remains the closing of the conjunctival wound with silk sutures. If, however, a manifest degree of squint still remains, the correction of the remaining deviation should be secured by an immediate advancement, or tendon shortening operation, upon the external rectus muscle of the same eye. Under no condition should an increased effect be sought by separation of the belly of the muscle from Tenon's capsule during the performance of the tenotomy. The use of the usually recommended stitch to increase the effect is not advised.

The method of operating recommended may be criticised as being at variance with the views of certain authorities[2], but the writer has been in the habit of performing this double operation at one sitting on the same eye for the last twenty two years with most satisfactory results.

If, however, the primary division of the tendon of the internal rectus results in an over effect, this must be controlled by the immediate use of a correcting suture. The form of suture, which the writer can thoroly endorse, is the following: A ten day chromicized catgut mattress suture, size OO, is so introduced that the base of the suture is located in the belly of the muscle close to the cut end and in the overlying Tenon's capsule, and the two free ends are passed deeply thru the remnant of the attachment to the sclera left in consequence of the division of the tendon. This suture will enable the cut end of the tendon to be drawn towards its former attachment to the proper degree, and, when the free ends are tied, the entire suture will remain unabsorbed for a sufficient time to permit of a firm attachment of the tendon to the globe in its new position.

Since this is a practical surgical paper, it would seem appropriate to describe here the tendon shortening, or "tuck" operation referred to, which the writer has habitually performed since 1898. The "tuck operation," which in the writer's hands has proved eminently satisfactory, is the operation brought forward by Dr Francis Valk

of New York in 1897 with certain modifications. In this operation, the tuck is made with a single mattress suture of "O" or "OO" chromicized catgut and left buried, the flap of Tenon's capsule and conjunctiva being united over it by silk sutures, of which two are generally sufficient.

In performing this operation, I have found attention to the following points essential: (a) The careful freeing of the tendon from Tenon's capsule and separation of the belly of the muscle from the globe back to a point beyond the base of the mattress suture in order that the tendon may be permitted to slide forward when the suture is drawn taut to make the "tuck." (b) The passage of the ends of the suture thru the upper and lower thirds respectively of the attachment of the tendon to the sclerotic, embracing the dense episcleral tissue just at the tendon insertion, and the securing of a strong hold upon the belly of the muscle at the situation of the base of the mattress suture, by weaving the suture in and out as it is passed thru the muscle. These steps are necessary in order that the muscle, included in the base of the suture, may be brought sharply against the attachment to the sclerotic, and held there without slipping. In my experience in a great many cases, a tuck so placed has invariably held. These are modifications of the original operation suggested by practical experience at the operating table.

Another modification, which has been utilized by my colleague, Dr. H. B. Lemere, and myself, is the following, which we have found very useful. If after drawing taut and tying the mattress suture, an insufficient effect has been obtained, an additional effect may be secured by rethreading the needle upon one end of the suture, which has been left uncut, passing the needle farther back thru the belly of the muscle, and then tying to the other end of the suture left in situ. This makes a supplemental tuck, which, in our experience, has always held firmly. The "hump" in the muscle resulting from the tuck atrophies in a very short while and the tendon remains shortened in proportion to the amount of the muscle embraced in the mattress suture. This method has decided advantages over the usual technical advancement with a separation of the muscle from its attachment to the globe and with a reattachment by silk sutures at a point nearer the cornea. In the first place there are no sutures that can possibly cut thru the ocular tissues with a resulting slipping back of the tendon and loss of effect; in the second, the effect can be more accurately gauged and if not sufficient the accessory tuck can be utilized; and thirdly, since an absorbable material is used to make the tuck, there are no deep sutures to be removed afterwards[3].

In the case of intermittent strabismus of the convergent form, it may be easily possible to secure a permanent curative effect by the performance of this tendon shortening operation alone upon the external rectus of one or both eyes, combined with the use of the correcting lenses when required by a refractive error. It is in such cases that the tendon shortening operation performed on the antagonist without tenotomy of the internal rectus, is especially indicated. In young children the operation for strabismus of whatever degree must be performed under general anesthesia, which is a great disadvantage as the results at the table cannot then be accurately judged.

(b) The surgical treatment of *external strabismus.*

In the effort to correct an external strabismus, a tenotomy of the external rectus muscle may possibly be successful but in the great majority of cases it is not. We cannot expect as much effect on the direction of the eye to follow a tenotomy of the external as in the case of the separation of the tendon of the internal rectus muscle. The insertion of the tendon of the former muscle is farther from the cornea than is that of the latter, and the effect of an operation, in the nature of a setting back of the tendon insertion, is in direct proportion to the nearness to the cornea of the normal muscular attach-

ment to the globe.[4] Such being the case, in the great majority of cases of external comitant strabismus, the double operation on the squinting eye will be required, that is a tenotomy of the external rectus and a tendon shortening of the internus by the "tuck" method as described.

By the double operation on the squinting eye, as advised both in internal comitant squint when required and in external squint of the comitant type, in the majority of cases, the full effect is secured at one time, by one operation, on one eye, which is a most decided advantage.

2. The Surgical Treatment of Paralytic Strabismus.

In paralytic squint we are brought face to face with a positive pathologic state in each case. In considering the surgical treatment of such conditions, therefore, we must be careful to exhaust all therapeutic methods and to allow a sufficient time to elapse to prove that such means are hopeless before proceeding to surgical operation. A case of this type should not be operated upon in a shorter time than six months.

It may be stated as a general proposition that syphilis is responsible for the muscular palsy in fifty per cent of the cases. Other general diseases may stand in a causal relation; and focal infections may also play a definite part in causing such palsies, especially those resulting from infective disease of the accessory sinuses of the nose, and from apical infections of the teeth.

It goes without saying that an exact diagnosis of the type of the paralysis, and of the muscle, or muscles, involved must precede any operative attempt. Third nerve palsies are far more common than the other varieties, and in such cases we may find paralysis either of all the extrinsic muscles supplied by this nerve, including the levator palpebrae superioris, or of individual muscles supplied by certain branches. Paralysis may affect the superior oblique or external rectus muscles alone, due to a lesion involving the 4th or 6th nerve respectively.

Given a permanent palsy of the muscles supplied by the 3rd nerve with an external strabismus accompanied by ptosis, the writer would advise the following method of procedure: The ptosis should be corrected at least to the extent of uncovering the pupil. The Eversbusch or the Gruening operation will as a rule serve to meet this indication. It must be noted, however, that the Eversbusch operation is contraindicated where there is complete paralysis of the levator muscle.[5]

The correction of the external squint may be performed as a later operation, if a choice in this regard may be exercised; or the entire corrective measures, both as regards the paralytic deviation and the ptosis, may be done at one time either under general anesthesia or under local anesthesia with nerve blocking, which latter is to be preferred.

In performing this operation to correct paralytic squint, the writer first tenotomizes the external rectus and then secures the effect of an advancement of the internus thru the "tuck" operation before described. By this double operation the deviating eye can be directed straight forward and the distressing heteronymous diplopia, existing in the half of the visual field corresponding to the sphere of action of the external rectus muscle, can thus be relieved. If the internal rectus muscle is completely paralyzed, this is all that can be expected; but in some cases in which there is not absolute paralysis of this muscle, a surprising degree of converging power may be secured. This occurred in a recent case in the writer's practice, in which single vision resulted when looking outward, forward, and a little inward in relation to the affected eye.

In cases of this type, it is highly probable that the secondary contraction of the externus may still further compromise the action of the internus, thus causing this paretic muscle to lose all power of turning the globe inward even tho not absolutely paralyzed. When in such a case the secondarily contracted externus is tenotomized and the paretic internus ad-

vanced or shortened, the remnant of power remaining in the latter may be enabled to function to some extent.

The same method of procedure is advocated and practised by the writer in the case of internal squint due to paralysis of the external rectus, i. e. a tenotomy of the internus and a simultaneous advancement by the "tuck" operation of the externus to the extent of directing the eye straight forward.

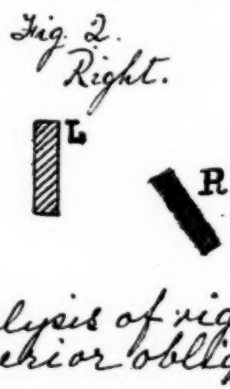
In the case of vertical squint, hypertropia, or hypotropia, which forms can occur independently from involvement of the respective supplying branch of the 3rd nerve in each instance, or where deviations occur from paresis of the superior and inferior oblique muscles, the surgical indications are as follows: In vertical squint the paretic muscle should be shortened (advanced) by the "tuck" method. This may be sufficient to relieve the deformity and secure single vision. If not, we shall have to increase the effect. The writer would advise for this purpose a very careful tenotomy of the antagonist of the same eye, barely separating the tendon at its attachment and treating its connections with Tenon's capsule with great reverence.

If too much effect should be secured in this way, which will be more likely in the case of tenotomy of the inferior rectus after advancement or tendon shortening of the superior rectus, it will be easy to correct this over effect and to secure parallelism of the visual axis in the horizontal plane and below by applying the same catgut correcting suture advocated in the case of over-effect discussed under the surgical treatment of comitant strabismus of the convergent type. The effect desired can be accurately secured in this way, as I know from practical experience, and this effect may be expected to be permanent. Before dividing the muscular attachment to the sclera in tenotomizing either the superior or inferior rectus, it is advisable to pass the correcting mattress suture thru the belly of the muscle and thru the overlying Tenon's capsule, as one will thus have control of the tendon. In case an over effect should result from the tenotomy, the two ends of the suture can be passed thru the remnant of the attachment to the sclera, and the muscle drawn toward its former attachment to the exact extent required. The ends of the suture are tied and cut short, and require no further attention.

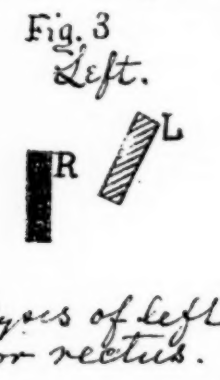
The writer is well aware of the fact that very different methods from those advised in the case of squint due to palsies of the superior and inferior recti muscles[6], have been advocated by men whom we consider authorities in ophthalmic surgery; and that he may be suspected of being the subject of a dangerous originality in the proposed advancement by "tuck" of the paretic muscle combined if necessary with tenotomy of the direct antagonist of the same eye supplemented by a controlling absorbable suture when required. Be this as it may, the fact remains that the result desired can be obtained most satisfactorily in this way with the operative measures confined to the strabismic eye and without interference with the sound organ in the way of curtailing its motility in certain directions to secure a compensating deviation tending to relieve the diplopia caused by the muscular palsy affecting its fellow. Thus for example in states of marked paresis of the superior rectus in either eye, Duane has advised a tenotomy of the inferior oblique of the other or sound eye, and this procedure has been quite generally endorsed.[7] The writer is opposed to crippling the motility of a perfectly sound eye to secure relief from diplopia resulting from a paretic affection of the fellow organ, when a perfectly satisfactory result can be secured by limiting the surgical interference to the affected side as recommended.

In paralysis of either the superior or inferior oblique, however, this limiting of the operation to the affected eye is impracticable. In the case, therefore, of paralysis of the superior oblique, the inferior rectus of the sound eye should be tenotomized; and likewise, where a palsy affects the inferior oblique of one eye, the *superior rectus* of the other should be set back by a tenotomy. The purpose of the operator in both operations will be to create

in the sound eye in each instance a deviation which will correspond to that induced by the paralysis affecting the other eye, with a relief of the diplopia as the result.



In Fig. 1 and Fig. 2 the positions of the double images are represented in cases of paresis of the left inferior rectus and of the right superior oblique respectively, while in Fig. 3 and Fig. 4



the positions are shown in instances of similar involvement of the left superior rectus and right inferior oblique.

It should be noted that the diplopia in the case of paralysis of the two oblique muscles is homonymous, while in involvement of the superior and inferior recti it is heteronymous.

In order, therefore, to relieve the diplopia, in case of paresis of the right superior oblique, the tendon of the left inferior rectus is set back causing the image in that eye (Fig. 1, L) to correspond with that of the right or paretic eye (Fig. 2, R.)

When the right inferior oblique is paralyzed, the effect of a tenotomy of the left superior rectus will be to cause the image, L, in the left eye (Fig. 3) to correspond with the image, R, in the right, or paretic, eye (Fig. 4), thus relieving the diplopia.

The same relationship would exist, of course, between the superior and inferior oblique muscles of the left eye, and the contralateral inferior and superior recti respectively.

BIBLIOGRAPHY.

1. Text Book of Ophthalmology, Fuchs, pages 762-763.
2. Ophthalmic Surgery, Meller, page 97.
   Ophthalmic Surgery, Beard, pages 164-165.
3. American Journal of Ophthalmology, April, 1920—Writer's paper.
4. Ophthalmic Surgery, Meller, page 99.
5. Ophthalmic Surgery, Meller, page 81.
6. Text Book of Ophthalmology, Fuchs, page 1023.

CONVENIENT AND ACCURATE MEASUREMENT OF BLIND SPOTS AND SCOTOMATA.

EDWARD J. BROWN, M.D.

MINNEAPOLIS, MINN.

This paper describes the method used by its author and gives some illustrative cases showing the importance of the results obtained.

A great impetus has been given to the study of the blind spot and paracentral scotomata by the ingenious and skillful work of Haitz, Peter, Wells Lloyd, Bissell and others. I was able to satisfy my own mind during 1918 that a modification of the Bjerrum screen was for such ordinary workers as myself, a more practical proposition. An expensive stereoscope with wide angle lenses as used by Lloyd and Bissell may have certain advantages; but my impression is that, in view of the fact that the determination of the limits of small scotomata with a one or two millimeter object and a very short radius, requires almost as much nervous tension on the part of the surgeon as a cataract extraction, its advantages are more than offset by a well lighted Bjerrum screen with a proper size of test object. This can be used at two meters with perfect comfort to both surgeon and patient.

For peripheric field taking and the coarse mapping of scotomata beyond 25 degrees my triplane perimeter described in 1917 (American Academy of Ophthalmology and Oto-Laryngology) is convenient and satisfactory. For the blind spot and paracentral scotomata my map constructed on rectangular lines after the Haitz charts, but adapted to a radius of two meters seems to me ideally practical and sufficiently accurate. To secure the advantage of binocular fixation, I have the patient look with the eye not under test at the fixation point thru a truncated cone 15 cm. in length with the small end about 1.5 cm. in diameter. With the majority of patients this is a decided help.

The map is very simply and easily made of brown shade cloth of thirty inches vertical and thirty-six inches horizontal measurement, with a slat at top and bottom and a large eyelet to connect with a strong wire hung from a picture moulding. The fixation point being at one side of the map, we have 36 inches (91.2 cm.), the tangent at two meters of 24 degrees. At 15 degrees the tangent is 21 1/8 inches (53.589 cm.), at 16 degrees approximately 4 cm. more, and the vertical distance for five degrees is approximately 4.5 cm., which will give about thirty five degrees above and the same below the horizontal. Inside ten degrees (length of tangent 13 7/8 inches or 35.26 cm.), the horizontal lines are for 10 instead of 5 degrees, which gives a fairly accurate and very convenient scale for mapping paracentral scotomata. As the map is reversible it is adaptable to the blind spot of each eye and to both sides of the point of fixation. Writers differ as to the dimensions of the normal blind spot of Mariotte. I have eight inches horizontal and ten inches vertical (20 by 25 cm.) as about the normal for two meters.

I am free to confess my ignorance of the significance of the enlargement of the blind spot in general, but I am confident that it is a very prevalent condition, and that it probably means a disease of the eye and of other associated organs in a far greater number of cases than is generally recognized. It is commonly believed to be an important symptom of glaucoma, but I have seen a number of cases where the enlargement was greater in the less glaucomatous eye. For example a Jewish tailor had been treated for attacks of subacute glaucoma by Dr. Scales of Pine Bluff and Dr. Levinsohn of Chicago and has had numerous attacks since coming under my care, all in the left eye. The right blind spot was decidedly larger in 1919 when measured on my map following an at-

tack of right acute antrum suppuration, and the same was true of the blind spots taken stereoscopically in 1918.

meters, the left nearer normal. In September the tonsils and adenoids were removed, the former very foul, the latter having an abscess 5/8 inch

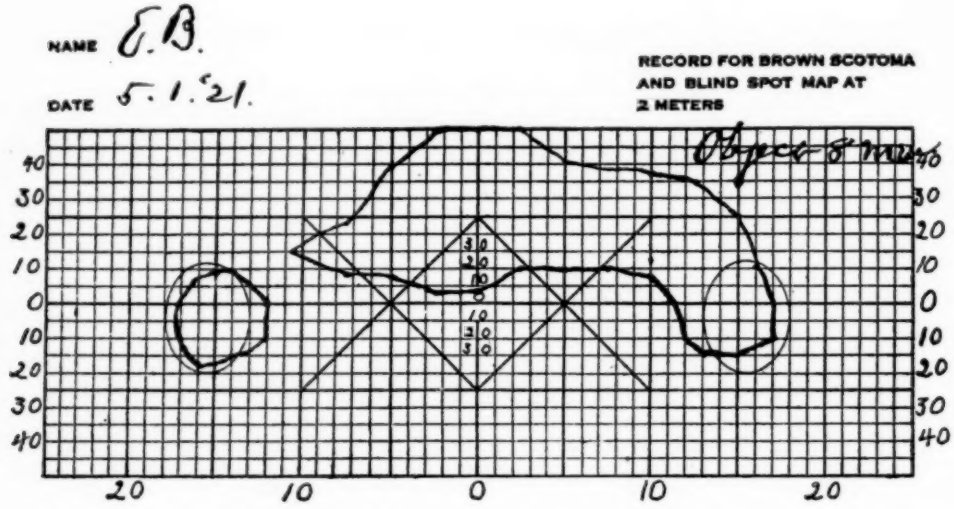


Fig. 1.—Chart of fields showing right paracentral scotoma, left practically normal blind spot.

A few other illustrative cases may be worth mentioning. F. R. F. 18, complained of asthenopia in 1918, had one quarter D. astigmatism and bad tonsils and adenoids. The blind spots were both very large and the right of irregular contour. In 1919 the right was still larger, 12x18 inches, at 2

in diameter and both very large. On April 26 of this year the left blind spot was normal in size and the right nearly so.

E. B. 70, with two diopters plus astigmia and 20/15 corrected vision has had disease for many years of the right antrum and ethmoid. The left B.S. is

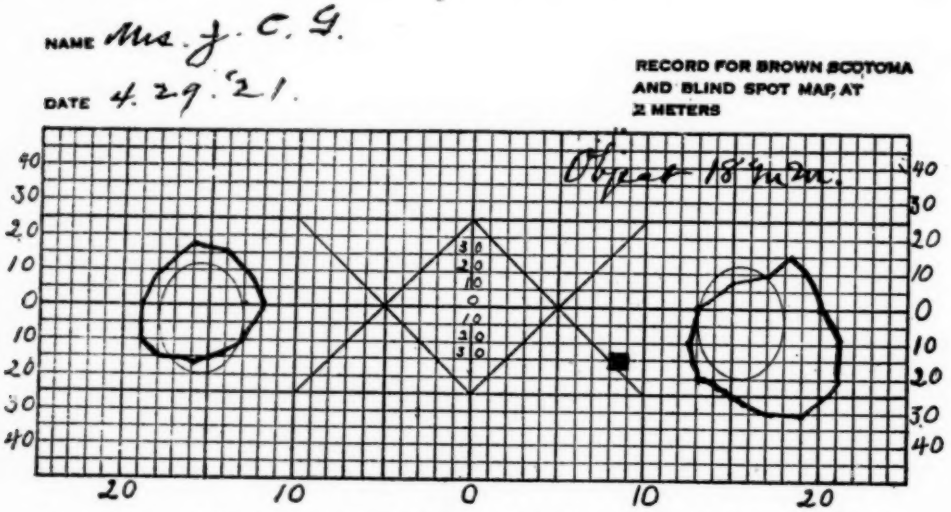


Fig. 2.—Chart of fields showing enlarged blind spots in both eyes with small scotoma in the right.

practically normal and there has been for some years a large paracentral scotoma of the right as shown in the accompanying chart.

Mrs. J. C. G. 61, came to me lately for a change of lenses. Corrected vision 20/30, when I had previously seen her in 1896, 20/15. At the earlier date I had treated her for what I considered specific rhinitis. There had been no other symptom of lues. At the late visit the Wassermann was negative, and the woman in good health. The corneas were moderately anesthetic, the anterior chambers shallow and the temporal discs cupped. Tension 31-24. The form fields were considerably contracted, for blue and green markedly so. Saturated red was seen as pink at the point of fixation in the right and in the left as red for about five degrees. The blind spots were both enlarged, especially the right, and the scotometer part of the map revealed a very small scotoma in the right inferior outer quadrant on the 30th meridian and between the 8th and 9th parallels.

TREATMENT OF DETACHED RETINA.

ROBERT SCOTT LAMB, M.D.

WASHINGTON, D. C.

This paper presents the reasons for assuming endocrin disturbances as connected with retinal detachment. It gives details of treatment based upon this view and some of its results. Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, April 21, 1921.

There is always a beginning to any theory, and as nearly as I can recall, the thoughts regarding the method of procedure to be described were brought about by the consideration of the case of a patient in whom there had been a previous detachment and whose recent detachment was of several months' standing. She was operated on twice by a very skilled ophthalmologist and came under my care with nothing but light perception and that not very certain.

It is almost impossible to describe the flood of thought and the various imaginings that come to one on the first fleeting observation and consideration of a patient, and so it was with this particular patient. My impression, gathered from the observation, was that this person had a physical development in which the dominating endocrin organ was probably pituitary and there seemed a lack of sufficient thyroid to carry on properly the metabolic processes of the body. The woman was beyond the climacteric and had, undoubtedly, during her lifetime hypersecreting thyroid with the flushed face and widely dilated pupils, but she had always been intermittently subject to melancholia and was unquestionably definitely vagotonic.

The treatment to be described later was carried out on this patient for a period of some months until she was able to make out outlines of windows, frames, cross-bars, tables, chairs, mantle and other objects around the room. Then there occurred a violent period of mental depression caused by the return of her daughter and her granddaughter to their homes in a distant part of the country; she wept for the greater part of each twenty-four hours during the succeeding two weeks. After this the failing vision indicated that any further attempt to restore it was not justified in view of the hardship of certain discomfort attendant upon the administration of a portion of the treatment.

Before describing the treatment or reciting further what has been done in connection with one of my cases, it may be well to consider very briefly a conception of the status praesens of the treatment of detachment of the retina, which presupposes to some extent a knowledge of the possible etiologic factors at the time that this treatment was outlined. The idea seemed to prevail that part of the cause of detachment of the retina was a lowered intraocular tension, fluid vitreous, also myopia in most cases, and a strain or injury by blow upon the eyeball itself. The remedy was either the hoped for spontaneous reattachment after a period of rest in bed with sand bags to the sides of the head and only such motion as was absolutely necessary on the part of the patient, in so far as the head was concerned; or resort to operation by trephining, puncture or, as one ophthalmologist decided, multiple puncture with cautery needle. This is certainly not a very hopeful picture when observed from the viewpoint of the ophthalmologist who is attempting to be of service in curing or alleviating ocular defects or diseases.

It is no wonder, therefore, that certain facts and theories should come to one in the hope of bettering the condition of a patient by methods which might be somewhat milder and might even perhaps more nearly approximate the end result desired, that of restoring vision to a greater or less extent; or if the worst comes to the worst, at least delaying the time when a detachment becomes complete and the eye blind.

My conception was that three things had to be done. One was changing the character of the fluid coming thru the eye in view of the amount of detritus and of viscosity of the fluid. The second was the removal, if possible, of the fluid lying behind the detachment. The third was the increase of the intraocular tension in order that the retina might be held in place, if once restored approximately to its former position.

To accomplish the first of these, Murphy drip, containing 10 grams of sodium carbonat and 20 grams of sodium chlorid to the liter of water was used at first daily and then every other day. To accomplish the second, cyanid of mercury, one to three thousand solution fifteen drops combined with three drops of 1% solution of acoin, was used once a week or ten days depending upon the amount of reaction which had taken place at the time of the injection. This was made deeply thru the conjunctiva into the tissue overlying that portion of the eyeball where the retina was detached. The third, was covered by the use of thyroid increased in dosage from one-half grain, three times a day, to a point where symptoms of oversecretion of the thyroid appeared. In addition to this, fibrolysin was given for the purpose of increasing the white blood corpuscles, thereby accelerating the natural processes of repair.

A report of one case somewhat in detail may be of interest, and illustrate the method sufficiently to form a basis for comment and criticism of the method used. On December 22, 1910, there came from Bloomsburg, Pennsylvania, a teacher of manual training, 34 years old, who had worn glasses for 24 years. In June the right eye became quite annoying on account of floaters. The patient was treated by Dr. Taylor in Wilkesbarre. Previous lenses indicated right eye minus 6.25, left eye minus 17. The right eye was more deeply set than the left and somewhat painful. There were vitreous opacities and cataract beginning at the posterior pole, and the pupil did not contract to light. The ophthalmoscope showed a detached retina of the umbrella type, more marked on the temporal side and including the macula. There was only one point of attachment visible. There were a few vitreous opacities in the left eye, the eye being otherwise relatively normal for a highly myopic eye; and with a minus 14 1/2 combined with a minus 1 1/2, cylinder axis 75 degrees, six-fourths vision was obtained. This glass was given him in Hallauer 67 and another Hallauer 64 contained a minus 12 1/2 combined with the cylinder for near work. He was cautioned to change his occupation and go out into the country and raise bees, chickens, flowers or do something which would not require any manual labor. He was seen again in June 1912; but not after that until brought to the office on April 11, 1920, with light perception only in the left eye. Ophthalmoscopic examination together with his previous history suggested the probability of detachment of the retina of the left eye, which extended so high that he could not see the thing he looked at. There was light perception above, especially toward the temporal side and very bad and very extensive detachment. On the 14th, he went to the hospital, at which time the detachment covered the area overlying the temporal side, nasal and below. The disc could not be seen and the vitreous was very hazy so that no details of the fundus could be made out.

The patient was put to bed in a recumbent position and cautioned to be relatively quiet. There was ordered for him a Murphy drip of sodium carbonat and sodium chlorid, one liter once a day. Internally he was given half a grain of thyroid three times a day and hexamethylenamin and aspirin, 5 grains each every four hours. Locally, there was administered every three hours one drop of the solution pilocarpin, grains 1/2, and dionin, grains 10, to a half ounce of water, to be followed for five minutes by hot applications. After keeping the patient on this treatment for a few days, the vitreous began to clear and some few vessels could be seen above the disc,

but the disc could not be seen on account of the detachment being so high as to interfere. He was then given an injection of cyanid of mercury, 1 to 3,000 solution, and this was repeated in different locations overlying the area where the detachment had occurred. In all four injections were given, when it became apparent that the retina was protruding less far into the vitreous chamber, and the disc began to be visible.

His vision on the 21st of April was sufficiently improved to enable him to see things straight ahead. At the end of two weeks he was allowed to sit up in bed. At the end of three weeks he was able to sit up out of bed. Meanwhile, the Murphy drip had been given about every other or every third day.

By the last of May he was not only reading headlines in the newspapers but was able to sit out of bed and read. He was, however, kept under observation in the hospital for caution's sake until about the middle of July, after which he had no particular care except the use of the pilocarpin and dionin solution at home until October 22, when I visited his house. The ophthalmoscopic examination then showed with a minus 16 diopter lens a very clear area surrounding the macula and disc. Far forward in the lower nasal and temporal areas the detachment was still visible. There was a slight vitreous haze. The vision was quite good with the glass which had been given him some ten years previously. He was again seen on November 13 and a few words of caution given him about moving around. He continued the use of the pilocarpin and dionin.

On January 6, 1921, examination indicated that some change had taken place in the eye ground; there was slight edema of the retina above, marked vitreous haze, no further detachment, however, definable. He was advised to go to the hospital where he remained until the 14th of February. For the first few days only, he was required to lie quietly flat on his back and to have the Murphy drip. At the end of two weeks, he was allowed to sit up in bed.

Since February 15, 1921, he has been at home, using the thyroid and his eyedrops of pilocarpin and dionin. His vision remains quite good and the fundus very satisfactory.

Another case of much interest is one in which the detachment occurred in the right eye of a physician, a very busy man, who felt that he could not afford to lie in bed. This case has been conducted from the first as an ambulatory case and tho the vitreous is hazy the patient is able to maintain his field of vision and see objects without any particular difficulty, in fact, the field of vision is larger. I must say that he has neglected to take the treatment regularly at the office, and I have hopes that with regularity I should be able to do even more for him than has already been done.

A few running comments might not be amiss in trying to illustrate the conduct of the case above described. In the first place, it hardly seems a case of spontaneous reattachment in view of the amount of degenerative change present as evinced by the large area of detachment and the marked vitreous haze, together with the fact that he did not remain in bed for anything like the usual time that most cases of so-called spontaneous reattachment have been known to remain in bed. There was no operative procedure directed towards the evacuation of subretinal fluid but there was, possibly thru irritation, possibly thru the phagocytic action of the greatly multiplied leucocytes brought to the neighborhood of the detached area by the injection of the cyanid of mercury, an absorption of the subretinal fluid at least in part. The Murphy drip in my previous experience and in this case was undoubtedly responsible for the clearing of much of the detritus from the vitreous.

Asking the question, "Does the thyroid substance really increase the flow from the ciliary processes?" the answer is, "I don't know." I do know, however, that it does increase metabolism very considerably, which may

account for the betterment in the condition of the eye. But there is reason for presuming that it actually increases the flow. It increases the flow of tears; it increases the flow of saliva, especially in vagotonic individuals and it increases the flow from other glands of ectodermic origin. It seemed, therefore, more than likely that it might induce an increased flow from the secreting glands of the ciliary processes, and it was this bit of logic that led me to use it to increase the intraocular tension and thereby to hold in place against the subretinal and choroidal structures the retina, which, I expected, would be induced to assume its approximate former position by the withdrawal of the fluid behind it and be readjusted during its reattachment.

If these two processes could be made simultaneous, there was no reason, it seemed to me, why retinal detachment could not be treated without recourse to surgical procedures which have, in spite of Deutschmann's claims, never been universally successful. It seemed to me always that the lack of success has been due to the fact that the remedy was inadequate being to a certain extent, analogous to the replacement of paper upon a wall by means of tacks when the paste had become dried out. It could never be the same; it could never look the same and certainly could never function the same as if no mechanical injury had been done the retinal elements.

The advantages of such a method as described are immediately apparent; freedom from danger of infection; freedom from hemorrhage and other accidents incident to the mechanical entrance into the subretinal space and vitreous. The advantage, especially in a nervous patient, of being able to be up and about in a limited period of time following the inauguration of the treatment, is in itself sufficient to warrant the trying out of the method. The restoration of vision without scotomata of greater or lesser size, due to the mechancial injury incident to surgical procedures, is worth having. As to prognosis, one may say, as was once said by Sattler, the more recent and less extensive the detachment the more hopeful the outcome. In making the prognosis, one must, of course, keep in mind the relative normalcy of the good eye.

In conclusion, may I say that I believe there are some new view points here presented upon the subject of the treatment of retinal detachment and I hope a full discussion will support me in thinking this method of treatment useful.

NOTES, CASES AND INSTRUMENTS

GRAPHIC METHOD OF RECORDING TYPES OF EXCAVATION OF THE OPTIC NERVE HEAD.

HARRY GRADLE, M.D.

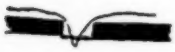
CHICAGO.

In the daily routine of office or clinic work, too little attention is paid to recording abnormalities of the normal fundus, principally because of the amount of time necessary for such a record. One of the highly important conditions of the normal fundus, and one which frequently is of great value in the differential diagnosis of diseased conditions found upon subsequent examination, is the type of physiologic excavation of the disc. Only too frequently is the notation of "large physiologic excavation" made upon the record, with no further annotation regarding the shape, size, or depth. The following classification is offered in the hope that the free use of the graphic method of annotation will lead to more extensive permanent records.

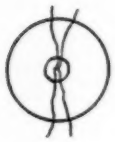
DEPTH OF EXCAVATION.

I. Shallow excavation, scarcely dipping below the plane of the surrounding retina.

II. Slightly deeper excavation, but still not so deep that the tips of the Lamina Cribrosa are visible.



III. Deep excavation with the tips of the Lamina Cribrosa visible.



CHARACTER OF EXCAVATION.

A. Centrally located excavation with sloping sides, involving not more than one third of the entire area of the disc.

B. Centrally located excavation with sloping sides, involving more than one-third of the entire area of the disc.

C. Excentrically located excavation with sloping sides.

D. Excentrically located excavation with a portion of the periphery with sloping sides and the remainder of the overhanging type.

E. Centrally located excavation with a portion of the periphery with sloping sides and the remainder of the overhanging type.

LOCATION OF EXCAVATION.

The point at which the excavation most nearly approaches the margin of the disc is to be recorded in terms of axes (American Astigmatic Axis Notation). Examples of records employing this method of notation would be as follows:

METHODS OF USE.

Ex. II-B would indicate a moderately deep centrally located excavation with sloping sides but not overhanging, occupying more than one-third of the area of the entire disc.

Ex. III-D-30 would indicate a deep excavation with the tips of the Lamina Cribrosa visible, an excavation with one side overhanging and the remainder sloping, located excentrically and approaching the disc most nearly at axis 30. (In the left eye, for example, this would mean 30 degrees above the external horizontal meridian).

VOLUNTARY UNILATERAL NYSTAGMUS.

JAMES MOORES BALL, M.D.

ST. LOUIS, MO.

The following brief account of a rare condition is submitted for publication for the purpose of securing priority. So far as the writer knows, only one like case (that of Pyle) has been recorded.

J. L., male, aged 21 years, consulted me on March 15, 1921, complaining of headache over the left eye—a symptom which had been present for six months. He also is troubled with after images.

The globes, adnexae, and pupillary reactions are normal. Stevenson's muscle test shows insufficiency of convergence varying from 1° to 14°. Kagenaar's ophthalmometer shows astigmatism with the rule: 0.75 D. in the right eye; 1 D. in the left. Vision in the right eye = 20/20; in left eye, 20/20. At this point in the examination the patient mentioned his ability to produce nystagmus at will, and at once gave a demonstration, as follows:—

Seated at one meter, fixing with his right eye, Mr. L., at will, could move his left eye inward and outward for about 2 millimetres from the vertical line. Meanwhile the right eye remained immobile.

Under cycloplegia (atropin) vision was: R. E.=20/50; L. E.=20/40.

R. E. with +.50 + .50 axis 90°= 20/13.

L. E. with +.75 axis 90°=20/13.

A Wassermann test was negative.

The writer expects to make a full report of this case at a later date.

Pyle: Jour. Am. Med. Assn., Dec. 5, 1908.

DIPLOPIA WITH LENS OPACITY

EDWARD JACKSON, M.D.

DENVER, COLO.

Mr. F., aged 59, lost useful sight of the right eye from being struck by an automobile, 8 years ago. The loss was noticed when he regained consciousness 26 days after the injury. The upper two-thirds of the optic disc is atrophic; but some vision remains in the nasal periphery of the field.

The left eye has corrected vision of 1.1 and a full field; but it has been

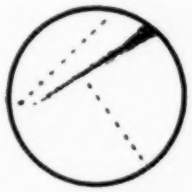


Fig. 1.—Diagram of pupil showing spicule of opacity of lens, and dotted lines to indicate axes of convex correcting cylinders in parts of the pupil above and below the opacities.

failing in the last year. The chief complaint is of diplopia, a bright image seen above, and a fainter image below to the left. These images have slowly become more widely separated. The ophthalmoscope shows a single definite spicule of lens opacity situated in the anterior cortex, extending from "two o'clock" toward "nine o'clock," as shown in Fig. 1. Otherwise the media are clear. In both eyes the vessels are irregularly constricted and the veins "kinked" where they cross the arteries.

Skiascopy shows entirely different refraction in the areas above and below

the spicule of opacity. Both are hyperopic; but the upper one seems to need a plus cyl. ax. 30°, and is irregular. The lower one is more regular and seems to require a plus O. 75 cyl. ax. 130°, which gives the eye its best distant vision. The separation of the images is about as great as would be produced by a 4° prism.

On bringing a card before the eye so that it covered the upper area, the lower and fainter image disappeared. On bringing the card from below so that it covered the lower area of the pupil, the upper and brighter image disappeared. The ophthalmometer showed no corresponding defect or flattening of the cornea.

It was concluded that the diplopia was due to a slight relative flattening of the anterior surface of the crystalline lens, along the line of the spicule of opacity; that this flattening had been increasing. That this indicated a condition of shrinking rather than swelling in the region of the opacity. And that this shrinking in conjunction with the definite boundaries of the opacity and absence of haze in other parts of the lens, indicated that the lens opacity was likely not to increase.

CIRCUMSCRIBED ECTASIA OF THE CORNEA.

G. N. Brazeau, M.D., F.A.C.S.

MILWAUKEE, WIS.

It is not unusual for thinning of the cornea, from either traumatic or infectious inflammatory causes, to end in a keratocele, but in cases such as this one the cause remains unknown. In this latter variety, the ectasia is more or less symmetrically developed in both eyes, tho its bilaterality could not be determined here as the right eye had been removed many years ago. Circumscribed ectasia is an appanage of old age, rarely occurring before 60 years; this patient was 72 years. It is of very slow development, transparent, and usually accompanied by very high astigmatism, 7 to 13 diopters with myopia, which accounts for the poor vision following it.

This patient has always done very fine needlework with the aid of a minus 4 diopter lens. She consulted me because her vision was reduced to counting fingers at three feet. Besides noting the ectasia, I found an almost complete opacification of the lens, the anterior chamber very deep, the iris funnel shaped, the tension and the light perception normal. The ectasia occupies the upper margin of the cornea for about 3 mm. and is opaque, the rest of the cornea is clear. The opacity is concentric with the limbus, from which it is separated by a narrow strip of transparent cornea.

Fuchs believes that ectasia is a degenerative process intimately related to an exaggerated development of the arcus senilis; while Terrien believes in the theory of dystrophy; and Lauber thinks it due to an inflammatory cause.

I advised removing the lens, since her previous vision had been so good. The poor vision that usually accompanies ectasia of the cornea, constituting its principal symptom, tho present now, is not due to any corneal irregularity but rather to the defective condition of the lens. Had the poor vision existing been due to any great amount of astigmatism the removal of the lens would again complicate the situation by adding to the already existing astigmatism, that, incident to a corneal section.

The usual treatment of ectasia of the cornea consists in correcting all the errors of refraction as well as possible. At best, the vision remains low.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Annual Congress was held in London, May 5th, 6th and 7th, 1921. Mr. J. Herbert Fisher, F.R.C.S., President.

The arrangements included the reading and discussion of papers, holding set debates, the delivery of the Bowman Lecture, by Mr. Treacher Collins, a clinical meeting at St Thomas' Hospital, a museum of exhibits and instruments and apparatus, and a dinner. It was a marked success, the attendances being well maintained at all the meetings.

The Personal Equation

THE PRESIDENT, in the course of his opening address, after expressing his appreciation of the high honor conferred on him by his election to the chair, said the complete ophthalmologist did not, indeed, could not exist. If perfection were attained, then there would be nothing more for which to strive, no further incentive to effort. The subject was as wide as the heavens, as deep as the ocean. To comprehend ophthalmic science as it now exists its devotees must perforce enlist as allies the mathematician, the physicist, the chemist, the physiologist, the anatomist, the physician, the surgeon, the urologist, the radiologist, the pathologist, the bacteriologist. Within the ambit of ophthalmology there was room for every man to exploit to the full the gifts and inclinations with which he had been endowed.

Perimetry and the examination of the central field for color defects, absolute and relative scotomata, were playing a larger part in eye investigations, and it behooved them to remember the personal equation when employing these methods, if right value was to be attached to their results. One investigator's charts would rarely be found to coincide with those of another on the same subject being examined. Only when a surgeon had stereotyped his own personal equation and controlled that of his patient, would his results on the same case on successive dates be reliable for clinical purposes.

Tonometry was tending to replace digital estimation of intraocular pressure, and it was for the younger ophthalmologists to explore its value. Not yet, however, would it supplant the older method. Every means should be taken to keep clear of error. The indication for or against operation in a case of chronic glaucoma would never be determined by such variables as the readings on a tonometer, or the shape or fluctuations of the blind spot, tho these observations should be a useful supplement to the well-trained clinician.

In ophthalmology, the symptoms narrated by the patient were ambiguous, the chief signs were precise. Too often the ophthalmologist was confronted with the highly myopic sempstress or clerk, incapacitated in the later years of working life by failing vision. A little guidance given to the progressive myope about to embark on the serious business of life—a suggestion as to suitable employment—might save such a one from a life of misery, ending in shipwreck. Compared with such help, the most perfect retinoscopy was of little value. In no other organ of the body, than the eye, was it given to the clinician to view the pathologic process in actual progress, and the ophthalmologist was proud to be called in by his colleagues to clinch, by his objective methods, the suspicions of grave local or general disorder. He could give much help to the neurologist in cases of hemianopia by the presence or absence of Wernicke's sign or pupillary reaction.

The President proceeded to advocate a closer working cooperation

with colleagues in general medicine and surgery; the gain would be mutual. But the ophthalmologist must keep his own house in order. The pupil must be taught to realize that in dealing with his patients he had responsibilities which he could transfer to no one else. Laboratory investigations might supplement his own work, but they were no substitute for it, and he must be trained to stand erect by himself. The study of disease in the eye could be undertaken only by those who had been trained in every branch of medicine and surgery; on this there could be no compromise. Ametropia and its results could not be surrendered to the optician. Physiologic working, not visual acuity, was the goal of the refractionist. 6/6 vision was not proof that the most serious—or indeed any—disease of the eye was not present. Mr. Fisher concluded with a sympathetic appreciation of the work of two recently deceased members of the Society, Mr. Charles Higgens, and Mr. H. E. Juler.

On the motion of Sir Anderson Critchett, the President was cordially thanked for his address.

Cyclitis with Parotid Swelling.

Mr. Maitland Ramsay, Glasgow, read a paper on a case of cyclitis associated with swelling of the parotid glands, and paralysis of cranial nerves. The patient, an unmarried lady of 31, had had enlarged cervical glands removed at 6 years of age. After family trouble and hard work she awoke one morning with her lower eyelids puffy and her ankles swollen. No abnormality was discovered in the urinary, circulatory, respiratory or digestive systems. Swelling increased, and extended to her knees, and the skin of the chest was hyperesthetic, accompanied with intercostal pain. After ten days in bed the edema of the ankles disappeared, but not the intercostal pain. Even large doses of aspirin only gave temporary relief.

In the third week the left parotid gland began to enlarge, and the right a week later. A fortnight later the sight of the right eye became dim, and a similar condition came on in its fellow five days later; the eyes readily watered on exposure to light. The sight became very dim, and there was pericorneal injection with numerous spots on the posterior surface of the cornea, discoloration of the iris, irregularity of pupil, and a deep anterior chamber, but the intraocular tension was not increased. The visual acuity was R. 6/12, L. 6/18.

A week or two later there was sudden paralysis of the left facial nerve. Failure of vision was now rapid, and in a few days she could scarcely distinguish a hand held between her eyes, and she had a throat condition which interfered with swallowing; the soft palate was seen to be paralyzed. At this stage improvement set in, coincidently with the administration of thyroid extract, on the assumption that the condition was a deficiency disease. She got well. Neither mumps or diphtheria could be considered as causal factors.

Pupillary Membrane and Lamellar Cataract.

Mr. J. Gray Clegg, Manchester, read a paper on partial monocular lamellar cataract associated with persistent pupillary membrane and birth injury. Dr. Gordon Renwick cooperated with him. He showed and demonstrated the slides by the epidiascope, and raised the question whether the birth injury had anything to do with the association of partial lamellar cataract with persistent pupillary membrane. He referred to Treacher Collins' work on the subject.

Age Changes in the Refraction of Crystalline Lens.

Mr. G. F. Alexander read a paper on the influence of age on the power of the crystalline lens. He said the prevailing teaching inferred that in the lens there were surfaces acting as concave refracting surfaces, and that the increase in the index of the cortex was, by increasing their power, the cause of the diminution of the power of the lens as age advanced. The author, however, contended that there are no such surfaces in the lens. In regard

to refraction, a spherical surface separating two media of different index was convex if its centre is on the side of the one of greater index, and concave if it is on the side of the one with less index. And as in the lens and its nucleus the more central the lamellae were the higher were their indices, the center of their curvature must lie on the side of the medium of greater index. Hence the surface separating the cortex and nucleus is a convex and not a concave one; and a ray incident on either surface of the lens encounters in its transit thru it a series of convex refracting surfaces, and at no part of its surface a concave one. He contended, secondly, that the cause of the diminution of the power of the lens as age advances is the diminution in the convexity of its surfaces and those of the nucleus from their growth. He showed that the radius of the surface of the lens is greater than that of the surface of the nucleus. The only factor tending to diminish the power of the lens as age advances is the increase in the radii of its surface and those of the nucleus accompanying their growth.

Torsion in Near Seeing.

MR. ALEXANDER read a paper also on the estimation of torsion for near vision.

A Court Quack.

MR. R. RUTSON JAMES read a paper entitled, "Sir William Read, Oculist to Queen Anne and to George I. Quack, Mountebank." It was an exposure of extravagant claims to medical and surgical skill on the slenderest foundation, and a narration of the material success achieved.

Tumors of the Choroid.

MR. D. J. WOOD, Cape Town, sent two papers, which were read. The first was entitled "Two Cases of Flat Neoplasm of the Choroid." The first of the patients, a man aged 27, complained that during the last six weeks he had lost the sight of his left eye. There was a widely dilated pupil, unusual redness of the outer part of the sclerotic, and a detachment of retina close to the back of the lens. A colleague had discovered disease in the left antrum and in the back part of the lower jaw. Glands on the right side of the neck were enlarged. A portion of one which was taken away was supposed to be epitheliomatous. X-rays produced improvement. It was evident, however, that there was an intraocular tumor, as the iris began to bulge forward on the outer side. The eye was therefore excised from the optic nerve forward to the iris, with complete detachment of retina. The growth was everywhere in contact with the sclerotic, and infiltrated it; and it extended up to, without involving, the optic nerve.

The second patient was a Jew, aged 40, whose left eye was glaucomatous. The eye was blind, the cornea steamy, the pupil dilated, and there was an area of redness on the outer part of the sclerotic. The eye was excised. The tumor occupied the whole of the lower half of the fundus, and was a flat growth with a complete retinal detachment. It had begun close to the optic nerve, and extended forward to about the ora serrata. It was spindle-celled. Mr. Treacher Collins had examined the specimen, and considered it was of the epithelial type, the cells being arranged in alveolar fashion; he thought it was probably a secondary carcinoma of the choroid. A section from the glands in the neck showed an epitheliomatous growth.

Extension of Conjunctiva upon Cornea.

Mr. Wood also sent a paper on a case of symmetric encroachment of the conjunctivae on the corneal margins. The patient, a somewhat old man, had been treated for cellulitis at the root of the nose, and pus was evacuated from the lids of the eye The corneal margin was found to be covered by a ring of conjunctiva from 2 to 2½ mm. wide, and the conjunctival vessels were continued into it With a fine probe the conjunctiva could be separated from the cornea.

The Psychology of Vision in Health and Disease.

PROF. C. SPEARMAN, Ph.D., introduced the debate. He said we see objects in different places, and the question of the source of this power was one of the most difficult in psychology. Generally, the authorities had been divided into two antagonistic camps. The first consisted of the empiricists, who regarded visual place as the outcome of experience, arising thru some such process as "association" or "fusion." On the other side were the "nativists," for the most part psysiologists such as Galen and Johannes Müller, who maintained that the power was essentially innate. According to them, the apparent situation of any particle was "specific energy" of the particular nerve fiber stimulated. This camp had also brought forward a strong array of evidence, and claimed that pathologic cases favored their view.

There was no longer reasonable doubt that our spatial perception was, at any rate partly, determined by factors of hereditary character. If the origin was to be sought in experience, it must be in some degree that of our ancestors. Wheatstone made a serious breach in the extreme nativist theory when he showed that the pair of images thrown on the two retinas by any visible particle did not, in general, fall on "corresponding" points. It was, in fact, their very deviation from "correspondence" that furnished our chief criterion of distance and depth. A pair of images, he showed, tho thus falling on noncorresponding points, could, nevertheless, be seen as a single image.

Straub concluded that the binocular perception of distance must be merely derivative from the far older uniocular perception of it. Professor Spearman showed that two retinal points, altho truly "corresponding" and normally producing the same visual situation, engendered, under certain circumstances, different visual situations. In fact the spectacle might be presented of an object moving backwards and forwards altho, all the time, the place of retinal stimulation remained unchanged. He leaned still more to the empiricist school than to the nativist.

Evolution of Visual Perceptions.

MR. J. H. PARSONS, F.R.S., read an exhaustive paper on the evolution of visual perceptions, with special reference to the role of suppression. It is difficult to give an adequate idea of the contribution in a short precis.

Sir Robert Armstrong-Jones, the psychologist, spoke of an acute melancholiac being restored to mental health by having her refractive error relieved by glasses. He referred also to the relief produced on mental patients by appropriate color schemes.

Visual Auras in Epilepsy.

DR. S. A. KINNIER WILSON read a paper on psychologic peculiarities in certain visual auras in epilepsy. He related cases of idiopathic epilepsy which were distinguished by a mental state presenting curious psychologic characteristics of its own. He recalled that Dr. Hughlings Jackson had directed attention to this condition, and used several terms to describe the occurrences, one of which was a "voluminous mental state." Dr. Wilson said there were two distinct types which would interest the ophthalmologist. The first was the "deja vu," or the "familiarity" type and its converse the strangeness type (in which surroundings and conditions either seemed very familiar or unaccountably strange); and the second was the "visual memory" type. He gave examples of both from his own experience.

DR. A. S. PERCIVAL said a sensory impulse may not affect consciousness, and yet a coordinated movement in response to that stimulus may result. The psychology of vision really meant, he said, an inquiry as to how a physical or chemical change in certain nerve cells could give rise to a consciousness or sensation of light.

Amblyopia from Disuse.

MR. FRANK JULER read a paper entitled, "Amblyopia from Disuse: Visual Acuity after Traumatic Cataract in Children." He said he had thought

that more light might be thrown on this subject by evidence which gave more exact definition or determination of dates of onset than was obtained from ordinary strabismus cases. He thought that in certain cases of injury to the lens in young children a line of evidence might be obtained which would satisfy the disputators; and perhaps decide whether amblyopia from disuse exists or not. In most cases of traumatic cataract, he said, the opacity was rapid, and little light reached the retina after the injury. In some of his cases the lens matter had been evacuated soon afterwards, leaving only an opaque membrane, while in a few an artificial pupil had been made not much later.

Even in cases where an artificial pupil had been made, the deviation of images by the aphakic hypermetropia must be so great that the retinal impulses could not compete with or assist those transmitted from the retina of the sound eye, and one would expect these impulses to be neglected, with the consequent development of amblyopia from disuse, if such disease exists. The latter should still more certainly develop if an opaque lens or membrane blocked the light path for some considerable period.

He had been able to trace a certain number of the juvenile traumatic cataracts recorded in the Moorfields Hospital notes from 1910-17, to see them personally, in many cases to form a new pupil, and finally himself examine the vision, fundus, and other points in every case quoted. He found a striking line of difference between the final visual results, depending on the age at which the lens became opaque. None of the eyes which became cataractous before the age of 5 had retained a final central acuity of vision of 6/60. The series gave evidence that there is such a disease as amblyopia from disuse; that it affected the eyes of children up to 6 years, that it did not attack the eyes after the age of 7 years, that it was not merely a standing still of the development of the retina or of certain cerebral associations, but that it caused a real retrogression of the effective power of the retinal impulse on the consciousness after the macula had reached an age at which a central vision of 6/6 was normally present. The existence of amblyopia from disuse as the result of concomitant squint had been the subject of dispute among ophthalmologists for the last fifty years.

Changes in Visual Organs with Erect Posture.

Mr. E. Treacher Collins then delivered the Bowman Lecture, taking as his subject, "Changes in the Visual Organs Correlated with the Adoption of Arboreal Life and the Assumption of the Erect Posture." He was cordially thanked for the Lecture.

Treatment of Manifest Strabismus.

Mr. Claud Worth, in opening the debate, said the matters to be considered in the treatment of convergent squint were: (1) the prevention or cure of amblyopia ex anopsia; (2) the correction of the refractive error; (3) fusion training, and (4) operation. If a constant unilateral squint had lasted a considerable proportion of the child's life, in the absence of efficient treatment the deviating eye would be found to be more or less blind. Probably no one now doubted that the amblyopia was almost invariably acquired from disuse, and the loss of sight was more rapid the younger the child. One who began to squint constantly at the age of one year might lose central fixation in three to four months. The child must be forced to use the deviating eye; that was far more important than all the rest of the treatment of squint.

In a recent squint, to cure low degrees of amblyopia, or prevent it, the fixing eye should be kept under atropin until it became the deviating eye. The child should then be seen again after the effect of the atropin had passed off. After this, the deviation must be kept alternating, one or other eye being atropinised occasionally if necessary. If central fixation in the deviating eye was absent or unsteady, the atropin treatment was not sufficient. Then the fixing eye should be continuously occluded; intermittent bandaging was of little use.

With regard to correction of refractive error, no child was too young to wear glasses if they were required. As to fusion training, there were certain principles which must apply to all methods. The child must be young, preferably under 6 years of age, and the sight of the deviating eye must be good. A device should be used for throwing pictures simultaneously upon the macular region of each eye. The most difficult step was to overcome the suppression. A good way was by unequal illumination of the object slides in whatever instrument was being used, and the interest of the patient must be maintained during each lesson. The object of fusion training was not to correct the deviation, except in small degrees, but to enable the patient to see binocularly when the visual axes shall have been restored to approximately their normal relative directions.

With regard to operation, if measurements showed that the angle of deviation was increasing or was not decreasing operation became necessary. If there was no hope of binocular vision, he did not, usually, operate until the 7th or 8th year of age. Formerly, he frequently performed tenotomy of the internal rectus in combination with advancement of the externus in high degrees of convergent squint, but this practice was finally abandoned by him in 1905. Many of these cases had been followed by divergence long afterwards.

For many years he had been relying on advancement alone, and, except in very small deviations, both externi were advanced. He proceeded to enter into the minutiae of technic, concluding with the remark that there were practically unavoidable failures in squint operations; the result attained was a measure of skill and experience of the surgeon, who should be prepared to accept the responsibility for it.

Concomitant Convergent Squint.

MR. A. J. BALLANTYNE made a contribution in which he dealt with his own experience of concomitant convergent squint. In every case the first procedure should be an estimation of the refraction and the prescription of suitable glasses for constant wear. If there was merely a low degree of hypermetropic astigmatism, one would not expect glasses to influence the squint, and the wearing of glasses would be postponed until two years of age. In many the wearing of glasses, with training if necessary, was all that was needed. Practically all his cases were aged 7 years or under, the largest squint he had corrected was 40°, the patient being 18 months old, and the squint of two weeks' duration; in most of the cases the angle was 15° or less. If one eye was amblyopic, an attempt should be made to train it. In most cases, he thought, the amblyopia was the result of the squint. He applied atropin more or less continuously to the sound eye. He was inclined now to operate at an earlier age than formerly was thought desirable. Advance alone sufficed in many cases; he had never seen permanent over correction result from advancement or muscle folding, therefore he would not hesitate to operate at any age. Worth's operation could be depended on to correct 20° or 25° of convergence. The muscle folding operation gave about half this effect. He rarely did tenotomy of the internal rectus, and he objected to combining tenotomy with advancement at one operation in a patient under 16 years. If tenotomy were done in children, it should be in the nature of a last resort. Strabismus operations might be very disappointing in excitable and nervous children. Failure in operation was in some cases due not to slipping of the stitches, but to looking to a remedy of a mechanical kind for an error which was functional. His results from amblyoscopic fusion training had been disappointing. The varied pathogenesis of concomitant strabismus made it evident that the same treatment would not be suitable in every case.

DISCUSSION. Mr. M. S. Mayou said that if a patient had good vision in both eyes and there was some attempt at fusion, he operated as early as possible,

provided the patient had worn glasses a year without improvement. For convergent strabismus up to 15° he did tenotomy of the internal rectus, but in young children as much as 20° could sometimes be corrected by it. For convergent squints of 15° to 45° he did a tenectomy associated with tenotomy; he preferred a shortening of the tendon and using the stump of the muscle attached to the globe for holding the sutures.

Mr. N. Bishop Harmon said the factors responsible for squint could be grouped under three heads: (1) defects of the eyes; (2) defects of the muscles; (3) toxic influences, in the widest meaning of that term. Among 368 infants in a higher grade school, only 8 had emmetropic eyes, 6 had errors or refraction, mainly hypermetropia, and in 126 the errors were of considerable or even high degree. Yet among all those children there were only 8 squinters. The most influential factor in squint he considered to be defective balance of the muscles. His favorite method of operating was shortening of one muscle by subconjunctival reefing with lengthening of the antagonist by tenoplasty.

At the evening meeting the following papers were read:

Lieut-Col. H. Herbert: A Justification of the Wide Iris Prolapse Operation for Glaucoma.

Mr. T. Harrison Butler: On the Rational Treatment of Glaucoma.

Mr. C. Goulden and Mr. M. H. Whiting: Implantation Cyst of the Sclera following an Operation for Squint.

Sir William Lister: (a) Some Intraocular Epithelial Cysts; (b) Punctate Deposits in the Retina.

Mr. P. G. Doyne: Some Observations with the Scotometer.

On Saturday morning there were further papers, as follows:

Sir Arnold Lawson: A Case of Orbital Tumor (Neuroma).

Mr. Harold Grimsdale: A Note on the Mechanism of the Equilibrium of the Globe.

Mr. E. H. Stack and Dr. George Mackay exhibited motor trephines, and Mr. A. W. Ormond read a paper on Extraction of Cataract by Suction.

H. DICKINSON.

COLORADO OPHTHALMOLOGICAL SOCIETY.

April 16, 1921.

EDWARD JACKSON, presiding.

Orbital Tumor.

MELVILLE BLACK, Denver, presented a man aged 47 years who had come complaining of epiphora and double vision. The latter, which had first been noticed in January, was vertical and crossed, and was increasing. Downward and inward from the left eye, and a little to the temporal side of the internal canthus, was a hard round lump, which from its contour and solidity Dr. Black suspected to be a cyst.

DISCUSSION. C. E. Walker, Denver, had seen a case of tumor which started in about the same region and proved to be a sarcoma extending a good way back into the orbit. The tumor recurred, but the patient refused to have the eye removed and died some time later of sarcoma of the brain.

W. C. Bane, Denver, thought the growth a cyst connected in some way with the ethmoid sinus. The patient said that after manipulating the swelling it seemed to get larger and more prominent. Dr. Bane had operated some years ago on a child with a similar tumor which communicated with the nose.

H. R. Stilwill, Denver, had seen Dr. Black's patient about a year ago, when there was a moderate swelling at the inner canthus. The patient at that time complained of tearing, and now said that Dr. Stilwill had used a probe and had syringed thru the lacrimal passages, finding them patent.

J. J. Pattee, Pueblo, had removed a lipoma five years previously from a woman 35 years old. It was located just above the lower lid near the internal canthus, was quite solid, and remained intact during the excision.

In the course of several years there was no recurrence.

Edward Jackson, Denver, favored operation thru the conjunctiva. The location seemed an unlikely one for a dermoid cyst, but one must be ready to meet the difficult situation associated with such a cyst; and the presence of such a cyst or of a connection with the ethmoid seemed not improbable. The growth felt too smooth and regular for a sarcoma.

Brain Tumor.

F. E. WALLACE, Pueblo, reported a case of brain tumor in a woman aged 56 years, with an unusual symptom complex. Seen in July, 1919, she gave a history of dizziness and ataxia first noticed in the spring of 1917. Shortly after the first appearance of dizziness, she noticed difficulty in walking and later in standing erect. There had never been any nausea or failure of vision. The tendency was always to fall toward the right. Beginning early in 1918, there had been progressive deafness in the right ear, associated with pain. At the time of the examination the deafness of the right ear was complete, the hearing of the left ear normal. The pain in the back of the ear was continuous, and was so much worse on lying down that the patient had not gone to bed for a number of weeks. There was no appreciable history of headache. The patient thought that the symptoms had progressed much more rapidly since an attack of influenza late in 1918. For the past six weeks she had noticed a slight weakness in the lips, so that when she drank the fluid ran out of the right side of the mouth. The corrected vision was 20/30 in each eye. The eyegrounds were negative, there being no swelling of the discs or undue tortuosity of the vessels. The complete loss of hearing on the right side was of the nerve type. The neurologic examination pointed to a new growth, probably gliomatous, of the right auditory nerve close to the posterior border of the pons; and Dr. Philip Work advised that the case was inoperable. The patient was operated upon at St. Louis in December, 1920, and died on the operating table. Relatives stated that a tumor the size of a hen's egg was removed, and that before operation the patient was nearly blind and deaf, and extremely dizzy.

DISCUSSION. J. J. Pattee, Pueblo. The neurologic report referred to a lateral nystagmus. It is rare to get better than 20/30 vision with nystagmus.

G. F. Libby, Denver. Two years ago I saw a child of six years in whom I got vision of 5/6 in the presence of a nystagmus, which was continuous but very moderate in degree.

Dr. Wallace. My patient's nystagmus was not constant but was present only when she looked to the left.

A. C. Magruder, Colorado Springs. It would be interesting to discover whether the surgeon who saw her in the later stages of the disease noted the presence of choked disc.

J. A. McCaw, Denver, referred to a case which he had seen a year or so back in which there had been no choked disc, but a neurologist had found choking of the disc two weeks later.

Special Observations in Refraction.

G. F. LIBBY, Denver, gave a short talk dealing with a number of observations of practical interest as regards the treatment of exceptional refractive conditions. In *amblyopia*, while the poor vision made the selection of a lens difficult for the patient, yet accurate skiascopy, with persistence by the examiner in the details of the subjective test, would often be rewarded by an improvement of from twenty-five to fifty per cent under the use of the correcting lens. In *anisometropia*, altho it was commonly thought that not over 1.50 or 2 D. of anisometropia could be harmonized, Dr. Libby had at times been able to correct a difference of 6.00 D. or more with comfort to the patient. An example was given in which a man aged 36 years, who had been wearing for two years R. —8.00 sphere, L. —5.00 sphere, combined with +1.00 cylinder axis 90 degrees, found himself able to read with

comfort for hours upon wearing R. —11.00 sphere combined with +1.25 cylinder axis 90 degrees, L. —5.00 sphere combined with +1.25 cylinder axis 90 degrees; the vision of either eye as thus corrected being 5/6 partly. Patients who suffered from *nystagmus* often brought objects very close to the eyes in order to obtain accurate vision of small details, and in such cases, even in young patients, it was frequently justifiable to use a bifocal lens. Thus in a man aged 21 years who suffered from horizontal nystagmus, and who required a high plus spherical correction, headache which had persisted during one month on use of the distant glasses for close work had ceased upon employment of stronger spheres for near work; so that a bifocal addition of +2.00 D. sphere to the distant lens had been ordered and had proved very acceptable.

Discussion. Melville Black, Denver. I have not been impressed with the improvement obtained in amblyopic eyes where the other eye had normal vision. I have endeavored in many young patients, especially squinters, to exclude the good eye and force up the vision in a poor one. I saw today a child of seven or eight years who has worn an occlusive bandage for four months continuously, and the vision in the amblyopic eye was and still is 20/200. On the other hand, in cases typified by a patient who accepts 0.50 D. cylinder in one eye and 4.75 D. cylinder in the other, and where the patients have come to me uncomfortable with such correction, I have frequently put a plano over the worse eye and obtained relief. The discomfort produced in such a case is due to the marked prism action of the very unequal correction; yet this trouble does not occur in other cases of the same class.

J. J. Pattee, Pueblo. During a prolonged experience of Dr. Worth's very painstaking work in strabismus, I saw a large number of disappointing results after the use of amblyoscope and occlusion of the good eye.

W. H. Crisp, Denver, mentioned the case of a boy of 12 years in whom great improvement as regards school work had followed prescription of bifocal glasses; and further suggested that in highly anisometropic patients it was occasionally advisable to try the use of one eye for distant and the other for near vision instead of prescribing bifocals.

A. C. Magruder, Colorado Springs, referred to the excellent improvement in amblyopic eyes sometimes obtained by the use of the high frequency current.

Dr. Black. I have used this method for twenty years, and it is not infrequent to see a gain of at least a line on the test card after five minutes, but in many cases the improvement does not stick, and on the whole the treatment is disappointing.

Dr. Libby. There is not always a difference in focus between the good and the amblyopic eye. I gave up exclusion of the good eye long ago. In the case I mentioned all that was done was correction of both eyes.

Wm. H. Crisp, Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA SECTION ON OPHTHALMOLOGY.

March 17, 1921.

Dr. G. Oram Ring, Chairman.

The Modern Conception of the Anatomy of the Nasolacrimal Passageways in Man.

Dr. J. Parsons Schaeffer, gave a lantern demonstration of the anatomy of the nasolacrimal region. The strand of thickened epithelium along the floor of the rudimentary nasooptic fissure represents the initial stage in the development of the nasolacrimal passageways. The strand or cord of epithelial cells grows into the underlying mesenchyme, becomes entirely detached from the surface and encompassed by mesenchymal cells. The cord at this time is entirely solid and without connection with the nasal mucosa and the free border of the eyelids. From the solid cord of epithelial cells sprout both lacrimal ducts, the nasal end of

the nasolacrimal duct, and the cephalic portion of the lacrimal sac. The lumina of the several segments of the nasolacrimal passageways are established in a very irregular manner. The ocular end of the mother cord of the epithelial cells is the first to establish a lumen. The point of coalescence between the nasal end of the cord and the mucosa of the inferior nasal meatus is the last portion to become patent,—the lacrimonasal membrane 'rupturing' approximately at term. The horizontal portion of the lacrimal ducts establishes lumina before the vertical portion.

Many of the anomalies and variations in the anatomy of the nasolacrimal passageways encountered in infants and in adults are easy of comprehension and interpretation if one recalls (a) that the anlage or rudiment of the nasolacrimal passage ways is a solid cord; (b) that at one time the solid cord has absolutely no connection with the surface; (c) that the lacrimal duct, the cephalic portion of the lacrimal sac, and the nasal end of the nasolacrimal duct develop as secondary sprouts from the mother cord.

The cord of epithelial cells may at places remain solid, leading to atresias. One or the other of the lacrimal sprouts may fail to establish connection with the free border of the eyelid, giving rise to an absent duct. Multiple sprouts may grow to one or the other eyelid, causing a duplication, triplication, etc., of the lacrimal ducts. Additional sprouts from the sides of the solid nasolacrimal duct form the genetic basis of the diverticula encountered in later life. The coalescence of the solid lacrimal duct with the eyelids may be extensive, inviting the formation of a single, long slit-like ostium and of multiple ostia. The lacrimal sac may at an early time come in contact with the surface epithelium; canalization at such point would lead to a congenital fistula. Arrested development in the obliteration of the ocular end of the nasooptic furrow may be a factor in congenital fistulae. The several types of ostia nasolacrimalia in the inferior nasal meatus, found in the adult, are in accord with the potentialities of lumen formation at the point of coalescence of the solid epithelial nasolacrimal duct and the nasal mucosa.

The idea of an unvarying typical type of adult nasolacrimal duct and lacrimal sac, etc., must be abandoned. The newer anatomy of anatomic types is urged. This is more in keeping with the real anatomy than the notion of a typal form and all departures therefrom as anomalies. Recent investigations show at least two important types of nasolacrimal ducts are encountered: One type is more or less regular in contour and in direct line with the lacrimal sac with which it gradually merges. The other type is very irregular, somewhat tortuous and not infrequently connected with the lacrimal sac in a side-to-side union. Both types of ducts may have diverticula of various sizes. However, diverticula are more frequently encountered in ducts with irregular walls.

The nasolacrimal ostium, located in the inferior nasal meatus, is extremely variable in its anatomy. Two very definite types, however, may be mentioned: One type is located at the highest point of the inferior nasal meatus, immediately caudal to the attached border of the inferior nasal concha. Owing to adherence of the mucous membrane to the osseous boundaries, the nasolacrimal ostium stands permanently open, is wide-mouthed and unguarded by a mucosal flap or valve. Another type of ostium is located variously in the mucous membrane on the lateral wall of the inferior nasal meatus. Such ostia are slit-like and are usually guarded by a mucosal valve (Valve of Hasner).

In the endonasal operation on the lacrimal sac and upper segment of the nasolacrimal duct, one must recall that certain of the anterior ethmoidal cells, especially the frontal and the infundibular, lie in juxtaposition to these segments of the lacrimal passage ways. The same holds true for the prelacrimal recess of the maxillary sinus. These paranasal sinuses are readily opened into in this position. Of course, when the operation is done in the lower third

of the nasolacrimal duct, the paranasal sinuses referred to are not a factor.

Other factors being equal, it would appear from an anatomic viewpoint that an infected nasolacrimal duct and lacrimal sac would yield most readily to treatment in those cases in which the nasolacrimal ostium is large, permanently open mouthed and unobstructed by anatomic conditions of the inferior nasal meatus; moreover, in which the nasolacrimal duct is free of mucosal ledges and diverticula. On the other hand, one would expect infected nasolacrimal passage ways to resist treatment and the ailment to enter the stage of chronicity in those anatomic types in which the nasolacrimal duct contains diverticula (often without gravity drainage) and the nasolacrimal ostia are of small and inadequate size for efficient drainage; moreover, a nasal aperture or ostium so located that it is readily influenced by conditions of the inferior nasal meatus. The success or failure of non-surgical treatment of the diseased nasolacrimal passage ways is largely dependent upon the anatomic type of nasolacrimal duct and ostium encountered. In conclusion, the writer would urge the importance of the "anatomic type" clinically, not only in connection with the nasolacrimal passageways, but elsewhere in the body.

Operation for Intranasal Obstruction.

Dr. Sidney Yankauer, of New York, (by invitation) discussed the recent operative procedures for drainage thru windows resections and concluded that such procedures had usually failed to give permanent relief. He described his newer method of dissecting thru intranasal obstructions without distributing the lumen of the lacrimal canal.

Congenital Atresia of the Lacrimonasal Duct.

Dr. Wm. Zentmayer described the clinical manifestations, the complications and treatment of obstruction to the tear duct in the new born, and stated that, when cystitis develops, it is due to secondary infection. While there may be several causes for the clinical symptoms, the usual one is the retention of the separated epithelial cells which go to make up the core from which the canal is later developed, due to imperforation of the septum (Hasner's valve) between the lacrimonasal duct and the nasal chamber. The affection appears immediately or a few days after the birth of the child, at which time a small amount of discharge is noticeable at the inner angle of the affected eye. Bulbar conjunctiva is usually normal or but slightly injected. There may or may not be fullness over the sac. Pressure applied over this region may cause a gelatinous white fluid to exude from the punctum, or may be followed by a discharge from the nose. The affection is rarely bilateral. Nature in time usually corrects the trouble; but at any stage, infection of the contents of the canal may result in the formation of an abscess. As one observer has found that 25 per cent of his cases of dacryocystitis occurred before the tenth year, it is likely that chronic dacryocystitis in the child may be looked upon as a sequel of untreated congenital atresia. As the possible results of delayed opening of the tear passages may be infection, it seems wise at once to secure proper drainage. This is readily done by the passage of a small probe thru the dilated punctum, the canaliculus, sac, and canal into the nose. Local anesthesia only is required. One probing in the vast majority of cases is sufficient.

Newer Mercurial Preparations of Service in Ophthalmology.

Dr. T. B. Holloway referred to mercurophen, the product of the Dermatological Research Laboratory, which contains 53% mercury. He pointed out its very high bactericidal power as compared with other similar agents. In the laboratory tests, it was shown to be some two hundred times more active than bichlorid. He also referred to mercurochrome (220) and spoke of the laboratory investigations as conducted by Young, Swartz and White. Reference was then made to the comparative laboratory effects of

these two drugs on the tubercule bacillus as reported by Dr. De Witt. She believed that mercurophen particularly might be used with benefit in certain ulcerative lesions on account of its high bacteriostatic power. The recent report of Lancaster concerning mercurochrome was also referred to.

Dr. Holloway stated that he had had much greater experience with the use of mercurophen than mercurochrome, altho he was now using both drugs. He stated he had but little to add to what he had previously said in regard to mercurophen, but he believed this drug was most efficient against the pneumococcus, and as far as his personal experience was concerned, just as efficient as optochin. While mercurophen seemed to be the more active of the two drugs, it should not be forgotten that this product was used in the strength of about 1-8000 as an irrigating fluid, whereas mercurochrome was used in the strength of about 1-500 and usually instilled by the drop method. He felt, as so used, there was but little difference in their bactericidal action, as far as laboratory tests were concerned.

Discussion. Dr. Geo. E. de Schweinitz expressed his high appreciation of Dr. Schaeffer's admirable address. He was unable, he said, to discuss from the practical standpoint, Dr. Yankauer's well-described operation for the relief of dacryocystitis, as the technic was essentially one which belonged to the operative work of a rhinologist. With Toti's, West's and Mosher's operations, he had had no personal experience. He maintained, as he had on previous occasions, that a well-performed excision of the lacrimal sac was an operative procedure of great value, which had given him satisfaction for many years, and which he believed in many circumstances was superior to any of the forms of intranasal operation to which reference had been made.

Referring to socalled dacryocystitis of infants—congenital atresia of the duct—he thought it might be arranged in two groups: (a) those which disappeared without operation, the only treatment required being the instillation into the inner canthal area of a mild antiseptic fluid, followed, after systematic evacuation of the sac contents, by a gentle massage of the sac; and (b) those which required, in addition to this, the passage of a probe, readily inserted in the case of infants, to facilitate drainage.

He had found sulphat of zinc to be a useful collyrium, and had also employed argyrol, not, of course, by injecting it into the duct, but in the manner previously described. Recently, in several instances, he had employed mercurophen (1-10,000) for the same purpose, and also mercurochrome (1 per cent.). In a very few cases, owing to secondary infection, true purulent dacryocystitis supervenes in infants, and in these circumstances a more formal procedure may be required.

Dr. B. Alex. Randall said that it was at the suggestion of the late Samuel D. Risley that he made in 1881 a study of the lacrimal puncta and canaliculi, especially as to the presence of a definite sphincter at the punctum. Dr. Risley believed that many an epiphora was greatly relieved by dilatation of this narrowed opening and its behavior had strongly suggested a sphincter, altho this was denied by many authorities. Both in longitudinal and cross-section, such arrangement of the muscle fibers was clearly demonstrated, as shown in photomicrographs of Dr. Randall's preparations and by Merkel's picture in Graefe and Saemisch, and it was accepted by Leidy in his last edition. Among the eye instruments at the Episcopal Hospital when he took charge there 40 years ago, were lacrimal probes of v. Hasner, a right and left aneurism needle like instrument for use from the nose up. With such v. Hasner must have learned much practically as to the "valve" which he depicted and described in his book. Whether or not we accept his views, v. Hasner deserves full credit for emphasizing the essential importance of nasal inflammations, too generally ignored even today, in this connection.

The Maxwell Operation.

DR. WM. ZENTMAYER described the Maxwell operation, as he had performed it on both the upper and lower culdesac in a patient, seen at Wills Hospital, with a greatly contracted socket, and on whom several operations of different nature had previously been performed at another institution without success. He had found from previous experience that no special care had to be taken of the elevator of the lid.

Device for Spectacles for Infants.

DR. J. HILAND DEWEY showed a spectacle frame and basket-like contrivance for holding a pair of spectacles on a four months' old infant. The frame has short temple pieces reaching to the temporal region, with a loop on the end of each for holding a short ribbon. From this ribbon run three other ribbons, which pass around the head to the temple piece on the other side, one ribbon below the occipital protuberance, one slightly above the first, and the third considerably higher. These are joined by several vertical ribbons, which give it somewhat of a basket-like appearance. With the growth of the infant the attachment of the ribbon at one of the temporal pieces may be readily lengthened. In this way indentation of the nasal bridge is avoided.

Suspected Foreign Body in the Posterior Chamber.

DR. HUNTER W. SCARLETT exhibited a young man, who sought treatment in January, 1921, for inflamed eyelids of one week's duration. In both eyes there was a low grade blepharo-conjunctivitis, but examination of the right eyeball revealed an adherent leucoma running from the limbus at about 10 o'clock, in toward the center for about 2 mm. A thick grayish membrane adherent to the iris, filled the pupillary area. Incarcerated in this membrane was a cilia extending from the internal margin of the nasal side of the pupil, across the pupillary area into the anterior chamber, resting on the anterior edge of the temporal side of the sphincter iridis.

In addition, by focal illumination, there was a small radial slit in the iris, extending inward from about 7 or 8 o'clock, and at right angles to this slit, a small shining body which resembled a piece of polished brass.

The patient gave the history of injury to the right eye in 1913 by a piece of metal, while he was hammering a percussion cap, which exploded. He was immediately examined at the hospital by an oculist, and a piece of brass was removed under general anesthesia. Since that time he had had only light perception in the eye. Following the removal of the metal, which probably was in the anterior chamber, an X-ray was made with negative results.

Since his examination in January last, three X-ray examinations have failed to reveal the presence of a foreign body in the eye. The case is shown because of the unusual form of the injury, the presence of the cilia retained in the anterior chamber during 8 years without causing any apparent disturbance, and the suspicious substance lying beneath the iris in the posterior chamber.

DISCUSSION. Dr. Wm. Zentmayer thought that the reflecting body seen behind the iris was a foreign body.

Congenital Bilateral Ptosis with Inability to Look Upwards.

DR. BURTON CHANCE reported the case of a negro, aged 23 years, with congenital bilateral ptosis, the edges of the lids covering two-thirds of the cornea. While the orbiculars reacted, there was no action of the levators. When a test object was carried upwards, there was at once a tilting backwards of the head and a sharp depressed convergence of the axes of the globes. When the lids were raised by the observer and a test object carried on upwards, the globes failed to follow it; but at once there set in a rapid rotary nystagmic movement of the left globe. In the horizontal and inferior directions, there was no interference with the ocular movements. Voluntary efforts at convergence were futile until, with the lids forcibly raised, the

object was carried thru an arc from 15° below to 15° above the horizontal. There did not seem to be voluntary oblique action. The eyes were normal in all other respects.

The mother and a brother, about 10 years older than the patient, had the same deformity. A younger sister has normally functioning eyeballs and eyelids.

DR. CHARLES R. HEED, Clerk.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

April 18, 1921.

DR. E. K. FINDLAY, in the chair.

Corneal Ulcerations.

DR. FRANK BRAWLEY: This patient came to me March 13, 1920. He gave a history of having had a foreign body in the eye, which he said he had rubbed out. The next morning the eye was filled with secretion. Cultures, using various media, have been made without finding any bacteria except an occasional staphylococcus. August 25th there were three superficial ulcerations which stained lightly for about two weeks time. They healed, leaving very fine nebulae. Every effort has been made to rule out all possible sources of trouble. Treatment has had no effect on the eye. The condition has continued practically the same. His vision on April 12, 1920, was 6/6 and today it was 6/30. I tried to exclude malingering on taking the vision.

Dr. E. K. Findlay saw the case with Dr. Brawley and suspected malingering.

Exophthalmos.

DR. MICHAEL GOLDENBURG. This case, a child, about six years of age, was brought to the clinic on the 29th of this month with the history that her eyes seemed to be growing larger for the past six months. A picture taken of the child about a year ago revealed no such condition. We found upon examination that there was a von Graefe sign, a Stelwag sign, and a hippus. The pupils were equal. X-ray and neurologic examinations were negative. Examination by an internist disclosed nothing, with the possible exception of an enlarged thyroid. He states he found no evidence of hyperthyroidism.

DISCUSSION. Dr. Robert von der Heydt stated that as long as it is not known what is the matter, the child's eyes should be watched at night and the cornea that was exposed should be bandaged.

Dr. George F. Suker stated that this class of eye condition with the von Graefe sign was very misleading. He thought our conception of this sign was not altogether what it should be. It was not a simple and regular lagging in the motion of the upper lid downward, as the eye itself turns downward; but, it was the jerky manner in which the upper lid should follow the downward rotation of the ball —in other words, the rotation of globe and lid downward is not synchronous. If this was present, then there was a neurologic lesion; otherwise it was dependent upon the relationship between the anatomic position and size of globe to the eyelid and was mechanical in origin with this jerkiness in the upper lid action absent. This child had not the von Graefe lid sign as just detailed. It seemed to him, that as the child's mother had been of the same type, they were dealing with an affection or disassociation of action of the endocrin glands—either thymus gland or thyroid, or both. It was his opinion that it was a simple exophthalmos and not a thyroid exophthalmos.

Dr. Goldenburg, in closing, said that vision was 20/20 in the right and 20/25 in the left. The ophthalmoscopic findings were negative with the possible exception of a venous pulsation. He was fully inclined to think as did Dr. Gill, the neurologist, that the condition was an endocrin proposition.

"The Etiology of Uveitis."

Dr. Nelson M. Black, thought it generally considered at the present time that outside of cases of direct injury to the iris, ciliary body or choroid, there was no such thing as idiopathic uveitis.

The consensus of opinion as to the pathogenesis seemed to favor the toxic theory, altho some authorities believed

there was an actual bacterial invasion. The fact that many uveal manifestations cleared up quickly following removal of some well defined focus of infection in the body would incline one to accept the toxic theory. Those cases which did not improve or, at least, not in proportion to the improvement made in the accompanying malady, would suggest that the irritating factor in the uveal tissue was of a more tenacious character than a toxin and might be bacterial.

Syphilis had been relegated to a position of minor importance. Uveal disease from old gonorrheal infections had not been given the consideration its importance deserved. Many of the cases formerly considered rheumatic, are gonorrheal in origin. A thoro investigation of the genitourinary tract should be a part of the routine, especially in cases of uveitis with a history of former gonorrheal infection.

Jackson is of the opinion that whenever clinical evidence of ocular tuberculosis is manifest, it is reasonable to assume a focus of previous infection.

The literature abounds with reports of cases of iritis, iridocyclitis and choroiditis of varying severity which are cured or greatly improved by removal of dental sepsis. The same was true with regard to foci of infection in the tonsils, the sinuses and occasionally from chronic ear disease.

Uveitis of gastrointestinal origin had been reported based upon the results obtained from correction of diet, relief of constipation and general improvement in nutrition. Rovinsky called attention to the possibility of the uveal tract being the seat of disturbance, the result of protein sensitization from ingested food.

Trantas found that lesions of the uveal tract constituted one of the important complications of relapsing fever. Gonzalez reported uveitis among other ocular complications in typhus fever, which Marin Amat considered was due to the toxins of the specific organism. Metastatic iridocyclitis occurring with paratyphoid fever was reported by Gilbert. Disturbance of the uveal tract after antityphoid vaccination was reported by Calhoun. Influenza was frequently complicated by uveal diseases varying from the mildest form of ciliary injection to profound involvement of the entire tract with total loss of vision. Kiep observed some form of uveitis in 5 out of 19 cases of bacillary dysentery.

Lack of internal gland secretions as an etiologic factor was substantiated by cases reported by Bordley and Galezowski. Lavergne and Terrien had observed a few cases of uveal infection associated with cerebral meningitis which resulted in rapid loss of the eye.

The Pathology of Uveitis.

Dr. Sanford R. Gifford, Omaha, Nebraska: The ophthalmologist has less need of pathology in the old sense of gross and morbid anatomy than other clinicians, for he may observe in detail the greater part of pathology in the living state. To the binocular loupe and the ophthalmoscope is now added the Gullstrand slit lamp, by means of which lesions of the cornea, iris and media may be followed from day to day in microscopic detail. Therefore the ophthalmologist needs less than others to consult the laboratory man as to what mysteries have been going on in his patient. While all clinical types showed numerous exceptions, the typical cases according to their etiology presented certain pathologic differences which might often be made out clinically.

1. The cases, due to focal infection, showed an affection of the anterior layers of the iris with synechiae involving only the pigment epithelium, and seldom showed any formation of nodular infiltrates.

2. Cases due to lues and tuberculosis showed lesions of the deeper layers with broad synechiae including iris stroma. Nodule formation occurs in most cases, in many of which it could be seen clinically. The larger nodules of each disease were usually clinically distinct and cases of tubercular uveitis without demonstrable tubercles were relatively rare.

3. Sympathetic ophthalmia was

characterized by a diffuse mononuclear infiltration of the whole uveal tract which might often be made out clinically, especially where the fundus could be seen.

Symptomatology of Uveitis.

Dr. William H. Wilder said that uveitis manifested itself as a low grade inflammation of any part of the uveal tract, usually very insidious in its onset. It might not be noticed until the exudate into the vitreous and into the anterior chamber clouded the media and obscured the vision. If the lesion was mostly limited to the choroid, the symptoms and signs might not be as conscious as when the ciliary body or iris were the chief points of attack, altho it was to be remembered that all parts of the uvea might be affected, if not to the same degree.

Pain might not be noticed if the choroid was the part chiefly affected, for this part of the uveal tract was devoid of sensory nerves. However, even in posterior choroidal congestion and inflammation, a deep seated dull ache, sometimes described as a pain, might be experienced by the patient. If the ciliary portion of the uvea was much affected, the pain might be more marked, and there would be the distinguishing signs of cyclitis, viz: tenderness on pressure over the ciliary region. If the iris was much involved, there might be severe pain in the eye or pain referred to the temple, cheek or forehead.

One of the most constant manifestations in uveitis is the presence of deposits on the posterior surface of the cornea, and opacities probably of a similar substance in the aqueous humor and in the vitreous. These well defined dots on the back of the cornea, varied in size from dust-like particles to little masses 1 mm. in diameter. As expressed by Nettleship, the largest of them look like "minute drops of cold gravy-fat, the smallest like grains of grey sand." Broken down chromatophores or cells from the retinal pigment layer of the iris might furnish pigment to some of the little masses. According to Friedenwald, the precipitates on the back of the cornea occurred in all forms of iritis and iridocyclitis at some time in the course of the disease, but in plastic iritis the masses of exudate were larger, clumped together, and fell to the bottom of the anterior chamber in the form of a hypopyon.

The degree of impairment of vision would depend upon the degree of haziness of the media and the extent of the involvement of the choroid and retina. If the macular region remained unaffected even with extensive involvement of the choroid, central vision might be only slightly, if at all, impaired.

Peripheral vision, as shown by the fields, might show all kinds of irregularities and contractions according to the degree and extent of the changes in choroid and retina. In extreme cases there might be atrophy of the optic nerve following upon degeneration of the retina.

As was usual in cyclitis or iritis, the tension of the globe was usually below normal. But one should not feel too secure about this; for even with the anterior chamber apparently deeper than normal, the tension might become elevated, sometimes to a dangerous degree.

He summarized by saying that in a general way uveitis was no more than iritis or an iridocyclitis of a socalled serous or serofibrinous character with coincident involvement of the choroid, more particularly the anterior portion. It was mild in degree, as a rule, and when so, might run its course without inflicting much damage to the eye. In its severer forms it might prove as disastrous as sympathetic iridocyclitis, whose clinical features it greatly resembled; altho they were by no means related.

The Treatment of Uveitis.

Dr. J. Brown Loring, stated that in the treatment of uveitis in general, it was necessary to make an individual etiologic case diagnosis, or treat symptomatically. We wished to relieve pain, prevent deformity, restore func-

tion and prevent recurrence of the attack.

Full dilatation of the pupil with atropin should be secured and maintained. Pain should be relieved as promptly as possible. No remedy, for relieving pain, reestablishing circulation and promoting absorption, equaled moist heat when properly applied. These processes should be assisted with powdered dionin. Eliminate thru all channels. In the deeper, more insidious forms of uveitis, the use of atropin was not so necessary. In the absence of a definite etiologic diagnosis, which required the greatest care to establish, the progress toward recovery was remarkably slow in many cases; whereas the detection and removal of the real cause was followed by very speedy relief.

In the forms of uveitis with increased tension, our success depended upon finding the etiologic factor and its removal, continuing, notwithstanding the increased tension, the use of atropin, together with the other remedies. This was noted particularly in the recurring cases from an underlying tubercular origin. If necessary an iridectomy should be done with a broad clean base, and treat the underlying disease. It was not so much the particular operation chosen to relieve the tension in these cases, as it was the thoro treatment of the underlying disease; the apparent recurring infection being due not to the form of operation, but to the lack of thoroness in the treatment of the disease.

In the gonorrheal cases it was advisable, in connection with the foregoing treatment, to proceed at once with the treatment by vaccines. Then, if possible, secure an autogenous vaccine and continue the vaccine until all evidences of the disease had vanished. In the chronic recurring cases of uveitis of its various forms, subconjunctival injections of the cyanid of mercury or of the normal salt solution might be used.

Discussion. Dr. Joseph L. Miller stated that he could discuss the question of focal infection in a general way or in the application to closely allied conditions, for instance, the question of arthritis. There was no doubt of the relation between the invading microorganisms in arthritis and in iritis. The question is, "was the problem of focal infection one where one was actually dealing with a small focus of chronic infection or was it a focal infection in the sense that the infection went thru an apparently normal mucous membrane." In pneumonia, for instance, it was known that pneumococcic infection went in thru the normal mucous membrane very commonly. The same was true of the meningococcus, which went thru the normal mucous membrane of the nasal passages into the brain. The same was true of poliomyelitis.

In observing the results one saw in acute arthritis, in the primary attack of any of these acute infections, one was hardly justified in saying that the removal of the focus of infection would prevent a recurrence. There were many cases with recurrence. If one could actually prevent a recurrence of the attacks, he thought he could feel that the focus was responsible for the attack. In an acute arthritis where there was a preliminary sore throat and the tonsils were removed, the patient the next time he got a sore throat had rheumatism. This had occurred so frequently that it seemed to him there was a great deal of evidence to show that the infection did not go thru the tonsils but entered thru the socalled normal mucous membrane. The same was true of chronic arthritis.

There were one or two other points he would like to call attention to, especially the significance of the tuberculin reaction, the local reaction one got in the eye following tuberculin injection. This had been considered as evidence that the patient had a tuberculosis. It had been shown more especially by Weichert that any protein injection, whether it be tuberculin or typhoid vaccine, would give rise to a local reaction. There was no temperature reaction, but one got a local reaction and it did not mean that the patient had a tuberculosis. One would find he would get the same reaction if one injected typhoid or any foreign protein. The

same might be emphasized when one spoke of the therapeutic value of tuberculin. There was a great deal of evidence accumulated to show that the effect of tuberculin was not due to tuberculin but due to the protein. Any foreign protein acted similar to tuberculin.

Another point brought out, was that, if there was a marked local reaction after removal of the tonsils, it might be taken as evidence that the tonsils that were removed were the source of the infection. He thought this was not necessarily true. Here again one had a protein reaction, that is, the operation permits the entrance into the circulation of quite a large number of microorganisms from such an infected tonsil, just the same as one got a local reaction after tuberculin or after the injection of any other protein.

He was not sure whether this question of focal infection might not play a more important role in uveitis than in arthritis. He would emphasize that one must be very careful about extracting teeth. He thought one of the things that was going to reflect on the medical profession more than anything else as the physician of the future looked back on it, was the indiscriminate removal of teeth for every disturbance. He thought the tonsil was perhaps a little different, that is, one did not miss the tonsils; they did not serve any particular function.

Dr. William H. Wilder asked Dr. Miller regarding reactions obtained in an eye after injections of tuberculin. In an eye affected by uveitis, after a subcutaneous injection of a diagnostic dose of tuberculin, one might get a more or less marked reaction evidenced by an increased ciliary injection. How should such a phenomenon be interpreted? Was one justified in assuming that it was an indication that the eye was affected with tuberculosis?

Dr. Joseph L. Miller said that the general reaction indicated that the patient had tuberculosis somewhere; the local reaction indicated that the patient had an infected area. If one gave a patient with chronic arthritis a foreign protein or albuminose, within one or two hours the point would swell up and become very painful. If one gave a patient a tuberculin, he would get a reaction in the place of injection just the same. He would say the general reaction meant the patient had tuberculosis. The local reaction would only mean that the patient had an irritation which reacted.

Dr. Robert Blue stated that the writers of the first and second papers apparently did not agree on all points. Dr. Black stated that in the lesions of uveitis, bacteria were usually not present, while Dr. Gifford stated that in these lesions the bacteria were usually present, being carried to the uvea by the blood stream, either dead or living bacteria localizing themselves at some place in the uveal tract. All would certainly agree that the localization of bacteria in the uveal tract would cause an inflammatory reaction. One could also readily prove that uveitis could be produced without the presence of bacteria. Some years ago he performed a series of experiments on rabbits in which he introduced horse serum into the cornea of the eye, and two weeks later injected some of the same horse serum into the veins of the ears. Almost uniformly injection of the eye occurred, and in one case a posterior synechia.

Dr. Nelson M. Black in reference to Dr. Miller's mention of the fact that removal of the foci of infection in cases of arthritis was often followed by a recurrence of the arthritis, he merely mentioned the fact that removal of tonsils did not by any means remove all the chance of infection, as there remained the pharyngeal and lingual tonsil. The lingual tonsil might be a source of infection; further after removal of tonsils and teeth, which were possibly the primary foci of infection, the recurrent attacks of arthritis and uveitis might be due to the infection or bacteria within the joint or eye itself, transferred from the original source and now became the primary focus of infection. This would also account for those cases in which little or no improvement was seen when the tonsils

or infected teeth were removed late in the course of treatment.

Dr. Georgiana Theobald stated that in syphilis the lesions were usually larger and fewer in number; in tuberculosis they were usually small and more numerous. Syphilis was usually acute, while tuberculosis ran a more insidious course.

Dr. Theobald then showed slides of a case in which the pectinate ligament was blocked up by the serous exudate from an iritis which could easily cause an increase in tension.

Dr. Gifford stated that the metastases occurred in a large number of cases. He believed endotoxins could only be observed in small quantities in the eye, not in large enough quantities to cause uveitis, but he thought bacterial protein in the form of dead bacterial bodies could cause uveitis and possibly anaphylactic uveitis.

Dr. Harry Gradle stated that in recent years diagnosis had been aided by the use of the Gullstrand slit lamp. An inflammation of the iris could be diagnosed by this instrument considerably earlier than by any other methods, anywhere from 24 to 60 hours. There would show a dilatation of the vessels of the iris that was never seen in the normal eye.

Dr. William A. Mann spoke of posterior uveitis in which the only pathology was found in the vitreous humor. These cases were noninflammatory. There was usually a lowered vision—20/40, 20/50, 20/60, 20/70, and in the early stages no floaters were found. The only thing to be seen was a little bit of haziness that could be found by comparing the two eyes. In the other eye one got a clear view of the fundus; in the diseased one it was not so definite, but there was no redness and no inflammatory exudates. Later on his experience had been that these cases finally showed floating opacities, as if the minute particles clumped.

Dr. Robert Von Der Heydt stated that when the slit lamp was used it was not necessary to use any drugs for differential diagnosis. The condition in its very incipiency would show without the aid of drugs. Another thing demonstrated was that when the exudate was thrown out onto the iris, pigment proliferation was so stimulated that within twenty-four hours, the whole mass was covered with new pigment. It was coated like a chocolate drop. It seemed that the throwing out of this exudate stimulated the pigment to proliferate; it acted like a fertilizer.

Dr. Wilder, in closing his part of the discussion, said that the consideration of the subject had been much broader than he supposed it would be. Speaking generally, uveitis would cover various inflammations of any or all parts of the uveal tract, but he supposed it was the intention to limit the subject to those mild and insiduous forms to which special attention was given by many writers.

He thought Dr. Mann was quite right in saying that one must not expect to find continuously the precipitates on the back of the cornea or on the lens in a case of uveitis. They might come and go as the case varied in intensity, as might also the fine floating opacities in the vitreous. Diligent study of the case with enlarged pupils might be necessary to detect them in very mild cases.

He could not agree entirely with Dr. Gamble in regard to the vigorous and continuous use of atropin in such cases, and he thought it was wise to instruct students that they should be careful in the use of this drug. Some of these cases suddenly developed hypertension and miotics might be necessary or even paracentesis of the cornea. In the main atropin must be relied on to prevent adhesions of the iris, and to paralyze the ciliary muscle.

Dr. J. B. Loring said that in reference to the use of eserin in the treatment of these cases of uveitis, he thought most of us would agree that eserin if used should only be used temporarily. It lessened the hyperemia of the vessels for the time being and as soon as that hyperemia was lessened—it did not take but 24 hours—we should abandon the use of eserin and again resort to atropin. If used in a suffi-

ciently weak solution, there was no pain associated with it, the pain being due to the spasm of the muscle and not to a contraction of the vessels. If we observed this, we could with safety use eserin and alternate it with atropin, deriving some benefit from its use.

In reference to the early diagnosis of iritis, iritis rarely attacked both eyes at the same time. If careful pupillary reaction was taken, the eye that was affected almost invariably reacted more slowly than the other eye.

ROBERT VON DER HEYDT,
Correspond. Sec.

BUFFALO OPHTHALMIC CLUB.

DR. JOHN J. FINNERTY, Presiding.

March 21, 1921.

Cases of Ocular Injury.

DR. HARRY WEED presented a man who gives a history of being at work in a factory using a compressed air hose. The pressure of air ranges from 60 to 80 pounds and he wears a helmet with a wire gauze screen to protect the eyes. A blast of air was deflected into his eyes and particles of sand were taken from his eyes. When he first saw him the iris was tremulous and the lens was beginning to be opaque. Vision at the first observation was 20/40, and was steadily reduced until it is now 20/200. It has been stationary for the past two weeks.

In the other case the eye appeared just as it does today, except the tension was lower. On January 15th she gave a history of gradually failing vision over a period of several months. The only thing that seems to bear on it was, while walking along the railroad tracks about Easter time, she felt something drop into the eye; gradually the vision began to fail and she was having some pain. Tension at that time was Schiötz 5. She consented to come here but has refused an X-ray. Transillumination was negative except the upper portion of the iris was decidedly thin. He would describe the present appearance of the eye as an Elliot operation without iridectomy.

A Dermoid of the Orbit.

DR. F. PARK LEWIS showed a tumor which occurred between the lids in a patient twenty years of age. It has a yellowish brown texture, coming down to a pedicle. He thought before operating it was a remnant of a microphthalmos. The front of the tumor shows round and dotted lines as tho it might be a rudimentary iris. It was attached to a very firm pedicle as tho it might be a rudimentary eye tissue, but there was seemingly no eye in the orbit.

Therapeutics.

DR. HARRY GRADLE. I have recently been going over some of the drugs of the past few years and I think the use of some of those drugs is not as universal as it might be, because they are not as universally known as they should be.

Resorcin. The use of this drug in ophthalmology has been comparatively limited. Some twenty years ago my father used resorcin in cases of ulcerative blepharitis, 2% combined with precipitated sulphur in ointment form. This is combined with the usual local treatment of the conjunctivitis. However the use of the drug is limited there. Knapp of Basel suggested its use as an astringent, two per cent aqueous solution, in cases of low grade conjunctival inflammation. But there are certain contraindications. It has no value in purulent conjunctivitis. It is distinctly contraindicated in hordeolum and chalazion. It aggravates the case probably because of the closure of the mouths of the glands.

Another drug I have been using for about a year to some advantage is *Nizin.* It is a zinc product, and is used in about double the strength of zinc sulphat. It is slightly less irritating than zinc sulphat and it is more active upon the Morax Axenfeld bacillus.

The next drug along that line is a Dutch product, *fluorescein zinc,* a combination of potassium fluorat and zinc sulphat. This is used in a powder and is massaged into the conjunctiva. The presence of the powder causes lacrimation, and the tears dissolve the fluorescein

zinc, keeping the eyes bathed in a solution of the drug. That to my mind is the one ideal therapeutic agent we have in ophthalmology. This is of use in Morax Axenfeld bacillus infection and of no use in any other condition.

Mercurophen. This was devised by J. Shamberg in 1916. It has equal bactericidal properties with mercury bichlorid and oxycyanid. It is less irritating and distinctly less toxic. In the eyes it is used in the form of a wash. I have not found that mercurophen is able to clear up any type of purulent conjunctivitis alone but it is of great use in helping to clear up cases in conjunction with other remedies. One other use which mercurophen has is that it may be used in the disinfection of instruments. It does not affect them like mercury-bichlorid.

Mercurochrome. This was first proposed for use in gonorrheal urethritis. In this respect, it failed to live up to expectations, but it can be used to great advantage in purulent infections of the conjunctiva and cornea in one per cent solution. Of course, a great many will object to its use on account of its stain. It has been used to as high as five per cent, but is very irritating. In purulent cases, I instill a drop every hour. In other cases three or four times a day. I have not used it in gonorrheal conjunctivitis. It is not specific in pneumococcic infections. In ulcers of the cornea, mercurochrome may be used in one per cent to five per cent solution and in severe cases it may be used in the form of a mud. It stains the cornea very intensely, deeper than fluorescein. It stands out as a brilliant red. In tear sac cases mercurochrome is of advantage. It may be used freely in the acute form of purulent dacryocystitis of children.

Holocain. There is one value holocain has which Dr. deSchweinitz taught me In cases of socalled trophic or neurotrophic ulcers of the cornea, these small infiltrates lie near the limbus and holocain exercises a beneficial influence. From the standpoint of an anesthetic I have discarded it entirely, because we have something new.

Butyn. This I have been using for over six months. It is about one-half as toxic as cocain and has equal anesthetizing properties. It seems to have the power of penetrating the loose epithelium of the conjunctiva to a very great depth, and with three or four instillations a chalazion may be curetted without pain. It has no effect upon the tension of the eyeball. It does not affect the epithelium. The original preparation was put out as a succinat, which is not as good as the sulphat. It will stand boiling.

Discussion. Dr. Lucien Howe. In regard to anesthetics, we have a number of them, and one says this is the best and another one says that is best. We have no criterion, but it is possible to obtain a numerical expression for the amount of anesthesia produced by cocain or anything else. We know that any irritation of a sensitive nerve causes a rise in blood pressure. In other words we can determine from the blood pressure what the degree of anesthesia is. I think it would be a good thing if some of the young men would take this thing up and work it out.

Dr. Nelson Black. I have tried out at least two of the drugs Dr. Gradle has spoken of. I have met with unqualified success in the use of rescorcin. I remember he told me to use 2 per cent. I have been using three per cent solution. I have used it with a lot of men coming in with the ordinary forms of conjunctivitis and they are men who don't complain much of the use of the drug, but they do complain of the zinc solutions. I have used butyn in curetting chalazions and there has been no complaint at all, much less than where cocain is used. I have used mercurophen in flushing out the conjunctiva and there has been no complaint of discomfort. As to mercurochrome, I have had the same success as Dr. Gradle mentions in purulent conjunctivitis. We had one case of gonorrheal ophthalmia in a nurse, contracted at the County Hospital; and it seemed almost impossible to get rid of the bacteria. Mercurochrome 2 per cent was instilled every two hours and not until then was the smear negative.

Dr. Park Lewis. In removing chalazions there is an element of danger, where two or three of the tumors have to be taken care of at the same time. The action of cocain is exceedingly uncomfortable. I would like to make mention of the use of *thymol* in one of the mineral oils. I use a one per cent solution, which is remarkably effective in follicular conjunctivitis in three or four days. Sometimes I use a 2 per cent. I have also used it in acute exacerbations of chronic trachoma.

Dr. Starr. I have had no experience with these drugs except holocain and resorcin. I like holocain in some forms of corneal ulcers. I think it is antiseptic and has a beneficial effect aside from its anesthetic effect. I have used resorcin to the exclusion of any remedy in the treatment of blepharitis for a period of twenty-five years. I usually prescribe it with salicylic acid, which prevents stain. I use salicylic acid 2 per cent solution with 3% resorcin in water. I would like also to mention a combination which I have used in purulent conjunctivitis, particularly gonorrheal, with a great deal of satisfaction; and that is a mixture of 5% silver nitrat and pure phenol; about 30% of the pure phenol with 5% silver nitrat.

Dr. L. M. Francis. I have had some experience with mercurochrome but not in gonorrheal conjunctivitis. It is very effective in purulent conjunctivitis and corneal ulcer. I now use it instead of fluorescein. It has one awkward feature, and that is its staining quality. Acidulated alcohol will decolorize it. The use of resorcin is new to me. Holocain I use in the form of an ointment.

Dr. Bennett. I am particularly interested in butyn. In removing chalazions so many patients faint. You can do an iridectomy and extract cataracts, and yet in the removal of a chalazion with cocain you get almost always a syncope. Dr. Hubbell once taught me the correct treatment of ulcerated blepharitis. First remove the crusts and then brush the edges with 2% silver nitrat.

Dr. Phillips. I tried *acriflavin* in the case of a nurse who, from a bacteriologic examination had a pneumococcus infection. I tried optochin with no result. Using 1/1000 solution of acriflavin hourly it disappeared entirely. I have since then used it up as high as 1/50. I have used it in gonorrheal ophthalmia, and not one of the cases went over ten days without a cure. I like it better than mercurochrome.

Dr. Gradle. Another thing I would like to recommend is the use of *urotropin* as a preventive of infection. We know that urotropin when taken by mouth appears in the aqueous humor in about 45 minutes after its primary ingestion in a concentration of 1/10,000 to 1/2,500, which is sufficient to act as a preventive against infection. After infection is established, urotropin is of no value. I give 1 gram at first and then half a gram three or four times a day.

H. W. COUPER,
Secretary.

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MONOCULAR DIPLOPIA.

The patient's complaint of double vision should lead promptly to the testing of whether it is binocular or monocular, by covering each eye in succession to see if this leaves diplopia with a single eye in use. This begins the diagnosis; but it is only complete when the exact cause of the doubling has been determined for each particular case, and the significance of what the diplopia implies has been worked out.

This condition has been rather inadequately explained in the text books; and the lists they give of possible causes are often confusing. It is possible for the symptom to arise from conditions of the refracting media and surfaces; from peculiar displacements of the retina; or, perhaps, as a symptom of disease of the central nervous system. Such conditions as opacities of the cornea or lens or polycoria are associated with monocular diplopia; but the cause of it is the accompanying disturbance of regular refraction, not the opacity or multiplicity of pupils in itself.

A simple form of monocular diplopia is produced in the Schreiner experiment. A card held before the eye, with two pin holes in front of the pupil, will make a distant light look double, if its rays are not perfectly focussed on the retina. This anyone can try by imitating in his eye hyperopia or myopia by the use of a concave or convex lens before it. Only when the light is perfectly focussed on the retina do the two images fuse into one. Another very simple form of monocular diplopia is produced by placing the edge of a prism before the pupil so that some of the light reaching the retina comes along side of the prism, while some is deflected by coming thru it. The same thing is done by looking thru the edge of a correcting glass, where a prismatic effect is produced.

The monocular diplopia, produced by imperfections of the dioptric surfaces or media of the eye or by polycoria, is like that of the above experiments. An irregular cornea has portions which are so inclined as to deflect the rays passing thru them, as does the

prism held partly in front of the pupil. The opacities, that accompany such irregularities, tend to render the separate images more distinct. The same is true of irregularities in the crystalline lens, whether these are irregularities of surface or of refractive index, and the opacities that appear with them. In polycoria, the different openings in the iris correspond to the different pin holes of the Schreiner experiment, producing diplopia when the light entering the eye is not perfectly focussed on the retina. And in polycoria, one or more of the pupils is generally situated so far toward the periphery of the iris that the focussing of the light, entering thru it, is certain to be imperfect.

It is not generally realized how marked a monocular diplopia may arise from imperfect focussing (diffusion phenomena) thru a normal pupil of not unusual size. Looking at a white line on a black ground with a strong spherical lens or cylinder with its axis parallel to the line, will serve to bring out this kind of diplopia; which appears as a duplication of outline, rather than the perception of separated distinct images. This kind of diplopia is complained of by patients suffering from uncorrected ametropia of high degree, and is more noticed when the regular error is supplemented by irregular astigmatism.

The diplopia, that may arise in detachment of the retina, may be binocular, due to displacement of one retina so that it receives on an abnormal portion an image, the counterpart of which is normally received on the retina of the other eye. It may, however, be monocular, the light impressing both layers of a folded retina, one layer lying behind the other; or fall upon two folds that are in close juxtaposition. In either case, the double images are so faint or indefinite that they are not much noticed unless the sight is very defective in both eyes.

About the double vision noticed in connection with cerebral disease, our knowledge is not very definite. In most cases, the occurrence of such images has not been shown to have any definite relation to the anatomy and physiology of the visual centres. In this the double vision closely resembles the paresthesias of hysteria, and probably in most cases the diplopia is hysteric in character. It is well known that in connection with organic brain disease, hysteric symptoms are apt to arise. But these cases should be studied in minute detail to ascertain if there is any basis other than that of suggestion to account for them.

All cases of monocular diplopia are worthy of close study, and they may help to throw important light on the origin and prognosis of the conditions on which the diplopia depends, or with which it is associated. In a large proportion of instances, there are more than two images present, polyopia; but the fewer the images the more readily they can be studied. A first step toward finding the full significance of the diplopia is to ascertain in which part of the pupil each particular image takes its origin. In a case of partial cataract, as that reported on page 673, this one fact may indicate swelling or shrinking of the crystalline lens, and thus add definiteness and certainty to the prognosis.

The connection with a particular part of the pupil is established by covering that part with a corner of a card, and having the patient notice that the image in question disappears. Changes in the images, and therefore in the conditions of the cornea or crystalline lens that cause them, may often be discovered by placing the patient in a certain definite, easily reproduced position with regard to a point of light; and having him make a drawing of the images he sees. The change in such images, produced by viewing them thru different convex and concave lenses, will sometimes help to determine their significance. Studies of such multiple images, made with care and accuracy, will generally be found interesting, and often afford important practical help. E. J.

SURGICAL ASEPSIS IN OPHTHALMIC OPERATIONS.

Recent observations thruout a number of American ophthalmic surgical centers bring strongly to mind the fact that the eye surgeon is by no means in the same class as the general surgeon, as regards certain points of technic and especially asepsis, and this applies not only to the average man, but to the leading operators as well. Little can be said but of praise as to their surgical diagnostic ability and their manual dexterity; but when it comes to the finer points of actual asepsis our surgical confreres, especially those who do abdominal operations, laugh at us.

God has indeed been good to the oculist—even in the old days of the frock coat donned in the morning, worn to the consulting room, in the street and crowded clinics and never even taken off for the washing of hands in the operating room. The ectodermic tissues of the eye, as has the lining of the nose, constantly exposed to atmospheric microorganisms have acquired a certain immunity. But let the globe once be opened the mesoderm is a fertile pabulum for disease germs. True it is that our hands and fingers do not come in direct contact with the tissues; and, if our instruments be sterile, nature forefends what few germs enter the bulb and it is not necessary for absolutely complete "surgical lingerie." Few of us care to diminish our *tactus eruditus* by the use of rubber gloves, as does Barraquer; and few of us go to the opposite extreme and rub the lids, or even press on the cornea, with the bare finger, as does Henry Smith.

What we particularly wish to call to the attention of ophthalmic operators, is the possibility of the present rate of intraocular infections after opening the globe, being diminished by the use of the head covering and the mouth mask, neither of which was much in evidence in the Eastern eye clinics and hospitals recently visited. Is not our hair always full of dust—of scales which carry infections, as well as innocuous germs; and which fall off in a shower when we stoop over, and certainly get into the eye of the patient in the customary posture in the operating room? Do we not also note the aura of steam extending a couple of feet from our mouths and nostrils, on a freezing day? Because we cannot see this in ordinary temperature, that is no reason for forgetting its existence.

Expired breath contains many droplets of water mixed with mucus and microorganisms. Then, too, every time we open our mouths to talk, actual drops of spit may be expelled with some force, for several feet, and saliva is certainly not clean. I know several world-famous operators with whom it is no pleasure to talk face to face, for they always unknowingly actual spit in the visage of the vis a vis. Especially in lecturing over a subject in the operating room, it is necessary to have a face mask and cap in addition to the usual operating gown and general care, for observers, assistants and principal operator. Thus we may not only lessen our infections, but our incomplete efforts at asepsis will cease to be a joke to the general surgeon. H. V. W.

BOOK NOTICES.

Regional Anesthesia, (Victor Pauchet's Technic), by **Sherwood-Dunn,** M.D., Officier d'Academie, Surgeon (Colonel) Service de Santé Militaire de Paris, Physician to the Cochin Hospital. With 224 Figures in the Text. F. A. Davis Company, Publishers, Philadelphia. 1921.

This book is one of the most astounding contributions to medical literature, of the decade; almost, it may be said, of the century.

Special surgeons, as well as those doing general work, have constantly practised local anesthesia. Indeed, present ophthalmology would be practically impossible without the local anesthetics. The same may be said of the operations in the nose and larynx.

Here the procedures have been so elaborated and yet so simplified, that almost any, even the most formidable

operations on any part of the body, seem adapted to this form of anesthesia. See the photographs of the smiling faces of the patients in the midst of operations for appendectomy, amputation of an arm or leg and extensive thoracic operations, and, most astonishing of all, during operations on the head, as, for the removal of the superior maxilla, which is simply astounding! True it is that some of us have enucleated eyes under local injections into the orbital tissues and by blocking off the ophthalmic nerves, done excision of the tear sac and plastic or minor operations on the face; but, when it comes to the Kroenlein operation, to craniectomies and to frontal sinus operations, under infiltration and regional nerve blocking, we are indeed appalled at the seeming audacity of the authors and would require proofs of the veracity of their statements, if we did not know that there are such things as spinal anesthesia, nerve blocking, infiltration and contact anesthesia.

The reviewer is also somewhat amazed to find that the credit for infiltration anesthesia, by weak solutions of cocain, is ascribed to Prof. Reclus of the Paris Faculté, dating back thirty years, for it was his impression and he had much experience with it in 1893-4, some twenty-eight years ago, having introduced the method into America, in an abridged translation of Dr. C. L. Schleich's (of Berlin, Germany), work on "Schmerzlöse Operationen," followed by several other papers and many demonstrations of its use in general as well as special surgery. Is it that this German obtained the method from the Frenchman, without giving him credit; or, is it the reverse? [Reclus seems to have called attention in 1889 to local anesthesia by injection of cocain solutions, and Schleich within a year or two later to "infiltration anesthesia." E. J.]

Be this as it may, the present author, Sherwood-Dunn, following Reclus, Pauchet, Sourdat and Laboure, combines the infiltration of the skin and subdermal tissues with nerve blocking. The medicaments used are as follows: (1) 25 drops of 1 to 1,000 adrenin solution to 200 mils of ½% procain solution; (2) 25 drops of adrenin to 100 mils of 1% procain; (3) 25 drops of adrenin to 50 mils of 2% procain; (4) 25 drops of adrenin solution to 25 mils of 4% procain. Twenty-five drops of the adrenin solution is the equivalent of 1 milligram of adrenin. The 4% solution is used but seldom for the cranial nerves and brachial plexus; the 2% solution frequently, as a rule for the nerve trunks; but the 1% and especially the ½% solutions are those most commonly employed, the latter for all infiltrations.

Regional anesthesia may be availed of in 80% of surgical operations. Its success depends upon the ability and experience of the operator, but the disposition and mental attitude of the patient also play an important part. Beginners are invited to use it not only in one type of case, but systematically in all cases, holding themselves in readiness to use ethyl chlorid to complete the work where necessary.

Cranial nerve anesthesia and the paravertebral, brachial plexus and transsacral procedures, which are most efficacious, require actual training. If the advice to learners is followed, this should not take a long time. Take a hatpin and skeleton and practise introduction into the cranial foramina, as well as into the paravertebral and sacral openings, in accordance with the landmarks mentioned in this book. Such practice will require one or two hours. The same experimentation should then be carried out upon a cadaver. This will also require about two hours of practice. After these two series of experiments, trials may be made upon the living subject.

For the remaining operations, trials should be made with the book by one's side, as is done by the internes in the author's service. Be gentle, patient, and persevering in spite of failures and the aversion of certain patients, and you will succeed with signal benefit to most cases and with general advancement of surgical practice.

The advantages of the procedures are low mortality risks, reduction of postoperative dangers, diminution of shock, absence of danger from asphyxiation and special advantages in certain operations, as bronchial tumors, laryngectomy, nephrectomy and cranial operations.

Complete anesthesia obtained by nerve blocking lasts from 1½ to 2½ hours. It is usually complete; but, if necessary, a few inhalations of ethyl chlorid may be given. Morphin-scopolamin, hypodermically administered, assists the general analgesia and makes a quiet patient, fully conscious and able to assist the operator in many ways. The anesthesia is distinct from the operation, it being done beforehand, and is complete in fifteen to thirty minutes.

There is no danger of necrosis of the tissues from nerve blocking; there is no vomiting and the operations are less bloody. Special training is required, but may be accomplished by the skilled surgeon or his assistant after a few hours study. There is necessity for gentleness and skill. The psychology of the patient must always be considered. Special syringes are advisable, with needles of various sizes and lengths, and the medicaments are capped in sealed, sterile ampoules. The mechanical procedures of the operations are those in ordinary use.

The procedures described in this book cannot be abstracted, as the language is boiled down to the limit of full technical description, and it must be read word by word and page by page, and then read over again. It is so interesting that the reader can hardly stop; so valuable that the special and general surgeon should have it as a guide, at his right hand, on his desk and in the operating room.

H. V. W.

Traité Complet de Thérapeutic Oculaire Générale et Spéciale. Dr. A. Darier, Ancien Président de la Société d'Ophtalmologie de Paris. Revised Edition Octavo 727 pages. Paris, Jouve et Cie.

This treatise, containing about twice the matter of Sydney Stephenson's translation of the first edition, fully justifies its claim to completness. It might well have been put out as an encyclopedia of ocular therapeutics, altho this is a subject to which a very large amount of new matter is added every year.

Its first part, on General Therapeutics, opens with a section of 28 pages devoted to a summary of tieologic diagnosis. This includes: clinical diagnosis; anatomicopathologic diagnosis; experimental and serum diagnosis; therapeutic diagnosis, and symptomatic medication. It might be thought strange that an account of ophthalmoscopy with redfree light and of the Gullstrand slit lamp, should open a work on therapeutics. But it must be remembered that refined and effective therapeutics is often but little more than exact and refined diagnosis; and these recent aids to exact diagnosis must reveal many facts that will be of greatest practical usefulness in therapeutics. Under serum diagnosis we find the long series of reactions ranging from the Abderhalden to the Wassermann, with information that will help the searcher for light on therapeutics.

Next follows the section of 70 pages on biologic therapeutics equally full of material that has come into the literature since the first edition of this book was published. Of course "paraspecific serotherapy" comes in for extended notice. Parenteral injections of milk also are referred to. Methods of application of medicaments, the importance of general treatment in ocular affections, physical agents and topical applications to the eyes complete the first part.

The second part devoted to Special Therapeutics takes up in detail the treatment appropriate to each class of diseases, as those of the lids, lacrimal apparatus, conjunctiva, etc. Glaucoma is considered under the heads; prodromal, irritative or inflammatory, chronic, simple, secondary and hydrophthalmos. While the various methods of surgical treatment are mentioned, little is said of them. On the other hand, the surgical treatment of

cataract is accorded 15 pages; taken up, however, with indications and complications, rather than details of technic, except as regards the anesthetics and other medicaments.

The body of the work is supplemented by a ready reference list of pathologic conditions arranged alphabetically, each with the appropriate remedies referred to and the pages on which these are discussed. This occupies 22 pages. It is followed by an alphabetic list of the principal medicaments employed in ophthalmology, which takes up 15 pages. Apart from these there is no index, but there is an extended table of contents and, near the end of the book, a summary by chapters.

The impossibility of making such a work perfect, or of keeping it so while coming thru the press, is illustrated by the absence of mention of recent cures of vernal conjunctivitis and tumors with radium; or the exact application of heat by the Shahan thermophore There will be a demand for an English translations of this book, in which these few omissions might well be supplied.

E. J.

Textbook and Atlas of Diseases of the Eye. Edited by **Th. Axenfeld** (Frieburg i. B) in collaboration with L. Bach (deceased) (Marburg), A. Bielschowsky (Marburg), A. Elschnig (Prag), R. Greeff (Berlin), L. Heine (Kiel), E. Hertel, (Berlin), E. v. Hippel (Halle), E. Krückmann (Berlin), J. Oeller (Erlangen), A. Peters (Rostock) and W. Stock (Jena). Sixth Edition—with 12 lithographic plates, 2 colortypes in the text and 636 illustrations, for the major part in colors. Gustav Fischer in Jena, Germany, 1920. (See also p. 147).

It is a pleasure and at the same time highly educational to review a book of this caliber, because a comprehensive review can be based only upon a careful study of the book in question. Let us consider it chapter by chapter.

In the Pathology and Therapy of Diseases of the Eye by Axenfeld, a general survey is made. It is interesting to note that in the use of salvarsan, it is advised that small doses be given in the beginning, but that it is without danger to the eye or optic nerve. Parenteral milk injections are still considered in the light of an experiment, altho the reported results are not questioned. The chapter on Examination of the Eye, by Axenfeld, is fairly comprehensive, altho considerably more attention could be paid to retinoscopy. The newer instruments such as the slit lamp, the Gullstrand ophthalmoscope, etc., are merely mentioned and not discussed at length.

Elschnig deals with Ophthalmoscopic Differential Diagnosis, and that part dealing with the nerve head and its excavation is excellent. "Every excavation that reaches the margin of the disc and has even one edge overhanging is pathologic. The bending of merely one vessel at the disc edge of an excavation is diagnostic of glaucoma." Choked disc is classified under Optic Neuritis, and it is rather remarkable to find that the author still considers it as an inflammatory condition.

The chapter on Physiologic Optics and Function Testing by Heine is simple and rather clear. He does not dip into the deeper mathematics, but his refraction could be improved upon. Some of the more modern methods of Function Testing are omitted or merely mentioned, but it must not be forgotten that these have not won a thoroly established place as yet. Disturbances of the light sense are dealt with at length, evidently influenced by the large number of cases of disturbed dark adaptation found in the field during the war. The Disturbances of Motility is written by Bielschowsky and is very good, as far as it goes. However, but little attention is paid to the heterophorias and none to the treatment thereof. The discussion of nystagmus is comprehensive and clear.

Von Hippel contributed an excellent and concise chapter on the Development of the Eye and Congenital Anomalies. The same author wrote

on Diseases of the Lids, an instructive chapter and well worth reading. The Lacrimal Apparatus was written by Stock and is more elementary than any other chapter in the book. One of the illustrations, that of Mikulicz's Disease, is evidently an old wood cut and should be relegated to an antiquarian museum, rather than adorn the pages of a modern textbook.

But the Conjunctiva by Axenfeld is a masterpiece, with every sentence pregnant and deserving of careful study. Of great interest to the American Ophthalmologist is the considerable space devoted to the defferential diagnosis between follicular conjunctivitis and trachoma. The author acknowledges that in some cases, an absolute differential diagnosis is not possible until the milder therapeutic measures have been used. Gonorrheal Ophthalmia and Inclusion-body Blenorrhea are differentiated as separate diseases and the presence of the Prowazek bodies is diagnostic of the latter, altho it is questioned whether they are the exciting factor. It is rather interesting to note that Axenfeld states postively that trachoma is clinically and experimentally proven to be a contagious disease with an incubation period of from eight to fourteen days.

The Cornea by Elschnig is on a par with the preceding chapter. The complete disc Keratoplasty (von Hippel type) is recommended as a standard procedure if the proper indications are present, showing that abroad this operation has passed the experimental stage. Phlyctenular disease is blamed upon the "exudative diathesis" both by Elschnig and Axenfeld. In parenchymatous keratitis, salvarsan has not proven any more beneficial than has mercury and iodid, but nevertheless, the arsenical preparation should be used to prevent the occurrence of other luetic manifestations.

The vascular anatomy of The Uvea is dealt with at length by Krückmann, who states that "the majority of inflammations of the anterior uvea are caused by circulating microorganisms and not by their toxins." Unfortunately (according to our concepts), rheumatism is considered as one of the main etiologic factors of uveal disease and "gout" relegates focal infections to a minor position. Furthermore, it is rather startling to read that the vitreous is considered purely ectodermal and that there is no hyaloid membrane.

The late Prof. Bach wrote the chapter on the Lens, which was revised by Axenfeld. The important work published by Vogt in the last few years is not mentioned, but otherwise the chapter is fairly complete until the surgery of the lens is considered. The expression of the lens as practiced by Smith is merely mentioned and the reader is warned against it. The Intraocular Exchange of Fluids and Glaucoma is by Peters, who is a firm adherent of the Leber theory of the formation of the aqueous and who maintains that the intraocular tension depends to the greatest extent upon the vascular pressure. The clinical classification and the description of glaucoma of various types is excellent and it is very noticeable that the operative therapy is discussed at length before the medicinal treatment is even mentioned.

Under Diseases of the Retina by Greeff, the etiologic factors of disease, as understood and searched for in this country, are discussed at length for the first time in the book. The anatomy of the retina and retinal disease is well handled, altho we are not accustomed to make a lethal prognosis in cases of nephritic retinitis. The operative treatment of detachment of the retina is discussed, but the author seems to have but little faith in it. X-ray treatment of the glioma *may be tried* in hopeless cases.

An equally good chapter is that on the Optic Nerve and Visual Tract, also by Greeff. In this, the disturbances of the visual fields are very well analyzed, altho the discussion of the etiology of neuritis is not sufficiently extensive. He adheres to the mechanical theory of choked disc and considers that puncture of the corpus callosum is the simplest and earliest treatment of papilledema. Retrobulbar neuritis of

rhinogenic origin is recognized as a separate clinical entity, and "in case of suspicion of disease of the accessory sinuses, immediate operation is indicated."

A short, but good chapter on The Orbit is by Peters. Hertel wrote on Injuries, War Injuries, Sympathetic Ophthalmia, and Compensation and his chapter is well illustrated. He gave the percentage of eye injuries in the World War as between 5 and 10% as compared to 0.86% in the war of 1870. The Sweet method of localization of foreign bodies does not receive the attention to which it is entitled and, according to our concepts, too much reliance is placed upon the sideroscope. The effects of war gas and the therapy indicated are gone into at length, a radical innovation in ophthalmic textbooks. The text is completed by a compilation of the Eye Conditions secondary to General Systemic Disease by Heine. The twelve illustrations of the fundus by Oeller are excellent.

On the whole, this is one of the best Ophthalmic Textbooks that has appeared. The printing and the illustrations are excellent and there are evidences of careful proof reading. No separate chapter is devoted to anatomy or pathology, but each chapter opens with a short anatomic description. The pathology is inserted as it occurs and is comprehensively illustrated.

Harry Gradle.

Defective Ocular Movements and Their Diagnosis. E. and **M. Landolt.** Paris. Translated by A. Roemmele and E. W. Brewerton, London. 100 pages, 27 illustrations. London, The Oxford Press.

This book has been published for some years, but it should be better known to English reading ophthalmologists. As the authors state in their preface: "We have not attempted to write a hand book but merely a handy book, a guide to aid the student and practitioner in finding his way over the oculmotor system, a path on which it is so easy to go astray."

The matter is arranged under: Anatomy and Physiology, Disturbances of the Movements of the Eye, Paralytic Strabismus, Strabismus Resulting from a Lesion of the Centres Governing the Symmetrical or Associated Movements of the Eyes, and Affections of the Ocular Mobility Following a Lesion of the Centres of the Equilibrium of the Body and Eyes (Paradoxical Affections). These titles have evidently been chosen after careful consideration and are worthy of thought.

They reflect a view of the disorders of the ocular movements very different from that set forth in most text books, or expressed in the usual paper, reporting the results of operations on the eye muscles; one that is more in accord with the sound views of physiology and conducive to the safer treatment of patients. The difference between an operator and a surgeon is nowhere more frequently illustrated than in the field of "operations on eye muscles;" and no class of cases more needs management with a broad view of the issues involved than these cases of defective ocular movment.

To get his early impressions of this field of practice from a book of such safe and sane view point, and minute consideration of methods of diagnosis, is a piece of rare good fortune for the young ophthalmologist. He should make himself thoroughly familiar with every part of it. Its brevity and condensation make it a book to be studied, digested, and applied in the study of cases and also in the study of other literature relating to the same. When one has mastered and used the book in this way, the fact that it has a rather imperfect index will be of small importance.

E. J.

Squint: Its Causes, Pathology and Treatment. By Claud Worth, F.R. C.S. (Fifth Edition).

The writer has given commendatory reviews of the four previous editions of this work, and this is no exception. Worth's opinions as to the causation and cure of squint, be it apparent or

latent, i. e., a heterotropia or a heterophoria, have gradually been accepted by the profession, so that there now are but few neglected cases, or those inappropriately or insufficiently treated, where the oculist has had the opportunity to apply his skill.

The erroneous idea formerly current, that a child "may grow out of the squint," is passing into oblivion. Worth shows that true squint is due to want of, or imperfect development of the fusion faculty, preventing the development of binocular vision; and is not in its beginning due to faulty insertion of the tendons, of the recti muscles or a paresis of the muscles. Heterophoria, however, is usually due to misplacement of these insertions. Moderate degrees of heterophoria are compensated for by the fusion faculty. High degrees of this latent squint need operation. A large proportion of cross-eyed children who are brought to the surgeon within the limits of time for the development of the fusion faculty, have this deformity corrected by glasses and development of this faculty secured by exercise of the fusion centers.

As regards operation, naturally Worth adheres to his own. He has practically, as have most of us, given up the operation of tenotomy, and advances the muscles. The reviewer has done this operation many times, but prefers an advancement and shortening operation which does not leave the resultant scar, and where there is no danger of going through the sclerotic, such as in that of Lancaster.

We hope to see in the next edition the assertion that "partial and repeated tenotomies are commonly done in America" expunged, for this method of treatment is certainly not in common use and is condemned by nearly all our surgeons. Previous editions of this work have doubtless been read by all those now in practice. The amendments and new subject matter included in this last edition render its possession valuable.

H. V. W.

Be Beautiful in Glasses. Frank G. Murphy, M.D. Mason City, Iowa. 16 pages, illustrated.

This pamphlet, in which more than half the pages are occupied with illustrations, is out of the lines of literature usually addressed to the ophthalmologist. Its author says that twenty-five years in active practice as an oculist have convinced him that there is a demand for such a treatise. When we consider how many patients have failed to receive the benefit that glasses would give because they think wearing glasses would make them "look horrid," it can readily be understood that the subject has practical importance.

The illustrations are diagrammatic, too much so to be always convincing; but they help to set forth ideas regarding the selection of frames that should be more generally considered. The work attempts to utilize certain principles regarding optical illusions that should be availed of to add to the pleasant impression of the face, rather than suffered to detract from it.

E. J.

CORRESPONDENCE.

IMPRESSIONS OF VIENNA CLINICS

A. S. Green, M.D.
San Francisco, Cal.
R. Pacheco-Luna, M.D.
Guatamala, C. A.

On the surface, Vienna shows but little alteration from what it was seven years ago, and apparently offers all its former charm and attraction. A little closer observation, however, reveals that life there is different now. The people are more shabbily dressed. To conserve light, cafes and theatres close at about ten o'clock at night. There are very few automobiles in evidence. The gaudily dressed officer or soldier of former days is conspicuous by his absence. These are the outward symptoms of a people in distress. Nevertheless, Vienna is crowded and the hotels are filled with foreigners from

adjoining countries, for whom living is very cheap on account of the rate of exchange.

The Algemeine Krankenhaus looked just as we last saw it in June, 1914, but the personnel of the ophthalmic sections has changed. The clinic of which Professor Fuchs was Hofrath, is now headed by Professor Dimmer with Purtscher and Lindner as assistants. Professor Meller is head of the clinic where Dimmer formerly was.

Professor Meller received us very graciously and explained the present state of affairs in the clinic and the prospects for the future. At the outset we may assert that Americans are very welcome at the clinic. Courses in Histo-Pathology, Ophthalmoscopy, operating, and so forth, are being given to the visiting physicians. The classes are small as yet, but are constantly growing. Professor Meller expressed the hope that the American Medical Association of Vienna would again be organized to facilitate the formation of classes and the arrangement of courses as was done before the war. The tuition fees are not increased, they are the same in dollars as formerly. Consequently, the cost of postgraduate study in Vienna is less than in prewar days because living is so extremely cheap. One can live very well on $30.00 to $40.00 a month. An American physician informed us that it was costing him only $20.00 per month, living in a good pension. This is made possible by the low rate of exchange in favor of the dollar, which at the present writing, April, 1921, buys over 600 kronen.

For money one can have anything with the exceptions, perhaps, of fresh milk and cream, and imported Havana cigars. But for the Austrians, especially the professional people and those with fixed incomes, it is an entirely different story. The incomes of the latter have increased but little. As a can of condensed milk costs 120 kronen, a pair of shoes 4,000 to 6,000 kronen and a suit of clothes 20,000 to 30,000 kronen, new clothes are out of the question. This accounts for the shabby appearance of the best classes. Many homes are mere shells, for they have been stripped of pictures, rugs and bric-a-brac to buy the necessities of life. Two to three thousand kronen a week is considered a good income for a physician, which is hardly enough to keep away hunger. A doctor told us of an instance where a certain professor actually died from starvation because his pride prevented him from seeking charity. In spite of this want, the population is quiet and amiable towards foreigners, whose visits it regards as one of the means by which the Austrian capital can be kept alive.

Professor Meller informed us that his clinic still receives the prewar allowance of 3,000 kronen a year to run on. As the American Journal of Ophthalmology costs them over 6,000 kronen, one may readily see how far this allowance reaches. But somehow, they manage to do the splendid scientific work they always did. The Vienna eye clinics are equipped with red free light and Gullstrand slit lamps, while, with the exception of Switzerland, they are practically still unknown in the other European clinics which we visited.

For the benefit of Medicine, we believe that the Vienna clinics should receive the support and encouragement of the Medical Profession of America.

Near Vision With Distance Lenses.

To the Editor: I read with a great deal of interest an article by Dr. F. Park Lewis, entitled "Focal Adjustment in the Aphakial Eye;" also a history report by Dr. Wm. R. Fringer, entitled "Aphakia, Near Vision with Distant Glasses," both published in your JOURNAL April, 1921. I, also, have had a case of aphakia where the patient used the same lens for both distant and near vision. I removed a cataract of the senile variety from the right eye of a woman 50 years of age in 1909. Vision in this eye had only equaled light perception for thirty years. There was no history of trauma. The left eye had been blind from a central leucoma for about the same period of time. This

condition was caused by a corneal ulcer.

Due to the fact that the incision was too small, there was some difficulty in removing the lens, nevertheless this was successfully done intracapsularly. Following the operation the wound refused to unite, and only after strenuous efforts were made did the union take place four weeks after the operation.

When I refracted the case I was very much surprised to find that the patient was able to read 20/25 without any correction, a minus 0.50 enabled the patient to read 20/20 with ease. The patient also surprised me by her ability to read Jaeger 0.37 m. with a range of two or three inches either with or without a minus 0.50 sphere. This vision continued good, she stated, until about two years ago, when her distant vision commenced to fail. Since her operation she has read several hours each day with ease.

I did not see the patient again until recently. On March 15 she came in for refraction and I fitted her with a plus 1.00 ax. 90°, with which she was able to read Jaeger 1. distinctly at 14 inches. Her distance vision had dropped to about 15/100 minus 1. This was improved to 15/100 plus with her correction. It also increased her ability to read Jaeger No. 1. Minus lenses did not help distant vision.

I found upon ophthalmoscopic examination a general disseminated choroiditis, but the macula was not directly involved. However there was a small spot the size of a disc diameter just above it. This must account for diminished central vision both for distance and near.

I believe this case is interesting from an optical standpoint, because of the fact that she must have had at least 10 diopters of myopia with a very small range of accommodation, even before the cataract developed. Also because it supports the theory advanced by Dr. Lewis as to the part placed by the vitreous humor in accommodation.

Sincerely yours,

CHARLES J. ADAMS.

Kokomo, Indiana.

ABSTRACTS

Moretti. Tenotomy and Muscular Advancement. Arch. di Ottal. v. 27 p. 159.

The author sums up some of the arguments in favor of both methods and decides that each has its place in selected cases. In cases of convergent squint his procedure is:

1. If the squinting eye is amblyopic and cannot be corrected by glasses, there is no object in doing an advancement as no functional result can be expected. If the deviation is more than fifteen degrees, a complete tenotomy is done and if this does not produce enough effect, a tenotomy of the other eye, complete or incomplete, according to the indications, is done later. If the original squint is less than fifteen degrees, a partial tenotomy is done, usually on both eyes.

2. If one eye is capable of useful function orthophoric methods, including muscle exercises and exclusion of the fixing eye are given a thoro trial and operative procedures undertaken only when they have definitely failed. If a purely functional squint remains without organic contracture of the muscles, an advancement is done. If the squint is less than fifteen degrees, an advancement is usually sufficient. If over fifteen degrees, a later tenotomy on the internal rectus of the same eye is usually necessary and in many cases is followed by a tenotomy on the internal rectus of the other eye if any deviation is left. If, after advancement, there is considerable enophthalmos and still some squint remaining, an advancement may be done on the other eye to make the deformity symmetric. The author describes his procedure by which he avoids the necessity of cutting a muscle, which he calls myotenorrhaphy. A conjuctival incision is made, the tendon isolated by two hooks, and a long incision is made in its middle, being longer in proportion as the deformity is marked. One double armed suture passes thru the belly, the needles being brought out thru the conjunctiva above and below the globe. When these are tied, the muscle belly is drawn close to the tendinous attachment, the strands being arranged in a flattened T. Two supplementary sutures are placed thru the conjunctiva and the scleral attachment while the assistant holds the eye out. Both eyes are bandaged for five days, after which the sutures are removed.

S. R. G.

Hagen, Sigurd. Reforming of Aqueous. Norsk Magazin for Laegevidenskaben, v. 82, p. 1.

It has been previously determined that if a rabbit's eye is subjected to irritation, either by the subconjunctival injection of hypertonic salt solution or by the evacuation of the anterior chamber, two phenomena appear: (1) the intraocular pressure increases in a few minutes but becomes subnormal inside of an hour, and (2) a marked increase occurs in the secretion of aqueous, which contains, in contradistinction to the normal aqueous, much albumin and fibrin. This increased flow of aqueous is proven to originate from the ciliary vessels thru a hyperemia.

The author, by experiments on a human eye, found that by evacuation of the anterior chamber, the normal intraocular pressure was reached only after an hour and a half, altho the chamber was refilled in four minutes. The newly formed aqueous did not contain more albumin than normal aqueous, or fibrin. He concludes that in the human the immediate reformation of the aqueous takes place from the vitreous by filtration thru the zonula of Zinn but the secretion from the ciliary blood vessels proceeds very slowly.

D. L. T.

Jocqs and Reinflet. Primary Circular Ulcer of The Margin of The Cornea. La Clinique Ophtalmologique, v. 25, 1921, p. 183.

The patient, aged 41, complained that the right eye was a little red and accompanied by some uneasiness. In

the superior internal region of the periphery of the cornea is presented a linear ulceration like the lines of the engraver, with clean edges about one mm. wide and six mm. long. The bottom and also the border of the ulcer is slightly white. The rest of the cornea is normal. There is a moderate pericorneal vascularization on the nasal side, tho it is not associated with an inflammatory reaction. The aqueous is transparent, the iris is normal and reacts to light. There is no photophobia, nor pain and the cornea has a normal sensibility.

He likens the condition to the ulcer of Zur Nedden; "the primary marginal ulcer," tho not exact for it is more regular. He does not accept that it is due to an organism and doubts that any organism could produce such a circular ulcer.

T. J. DIMITRY.

Magitot, A. Motility of the Iris, and the Preponderance of the Dilatator System. Ann. d'Ocul. v. 157, 1920, p. 332-352.

In this extended article, the author discusses the above questions under the following heads:

Vascular Theory. This explains the contraction and dilatation of the pupil upon the basis of a dilatation and contraction respectively of the iridal vessels. Altho there are undoubtedly slight movements due to these causes, and altho an inflammation of the iris with an overfilling of the vessels will cause a contraction of the pupil, the theory cannot explain the normal movements.

Vasomotor Influences. The existence of vasomotor influences upon the iris has been proven. But from the experiments of certain authors, it is possible to conclude that this is not the cause of the pupillary movements.

Inhibition Theory. This explains the dilatation of the pupil on the basis of inhibition of the action of the sphincter, permitting the action of the normal elasticity of the iridal tissue. This factor certainly exists, but it is insufficient to explain, by itself, the pupillary dilatation. It is accompanied by a contraction of an antagonistic system.

Iridal Musculature and the Two Antagonistic Muscles. The existence of a dilatator pupillae is generally accepted today. However, there are arguments against it, so the author gives a review of the arguments pro and con. His conclusions are:

(1) There is a dilatator force; (2) It is more powerful than the contracting force; (3) It is less affected by slight stimuli; (4) It can cause a local action in the iris, while that of the sphincter is more general; (5) It is governed by nervous influences from the cervical sympathetic via the long ciliary nerves; (6) This dilator force is present thruout the whole iris.

Is the socalled dilatator muscle, which is so delicate that it might rather be called a dilatator layer or myoid membrane, sufficient to cause dilatation of the pupil?

Arguments for: (1) Staining by picro-fuchsin; (2) The layer seems proportionate to the thickness of the sphincter; (3) It is composed of epithelium. The sphincter and ciliary muscles are likewise epithelial; (4) A stronger current is needed for dilatation than for contraction; (5) The physiologic dilatation has a very localized action; (6) Certain nocturnal birds of prey have a striated muscular layer in the region occupied by the myoid layer of the mammalia.

Arguments against: (1) A decided difference in the proportions of the sphincter and dilatator in spite of the preponderance of the dilatator force; (2) Henle's membrane nowhere shows waving or concentric folds when the pupil is dilated; (3) It ceases at the base of the iris. There is a space between the root of the iris and the ciliary processes. Nevertheless, excitation of the sympathetic will cause an increase in the dilatation of a pupil already under the influence of atropin; (4) The layer does not appear until the 7-9 month of pregnancy. Magitot has shown that in prematurely born children, photomotor reflexes exist as early as the 6th month, and are well developed by the 7th month:

(5) Compared to the sphincter, Henle's membrane has rather the character of intradermal muscles or the contractile cells of the glands. Its innervation should be of the same order, whereas, it is possible to dilate an isolated area of the pupil, but not to contract.

The preponderance of the arguments would seem to be against, but there seems to be no other muscle, capable of taking its place as a dilatator. The recent microscopic studies of the living eye would indicate that there are contractile cells in the stroma. It would seem that one of two positions must be taken; either the stroma is contractile, which would explain the power of the dilatation, or it is not contractile, in which case it is necessary to find another structure which will augment or replace the myeloid membrane of Henle.

C. L.

Jendralski, F. Radiotherapy in Tumors and Tuberculosis of Eye and Its Surroundings. Klin. M. f. Augenh. v. 65, 1920, p. 565, and v. 66, 1921, p. 96.

Jendralski reports on the results of radiotherapy systematically applied at the eye clinic of Prof. Uhthoff within the last few years. Seven cases of glioma retinae are reported in detail. Primary radiation, even in high doses was of no avail, and prophylactic radiation of the wound cavity, after operative removal of the eye yielded results only in 2 cases. In concordance with Axenfeld, the author believes that primary radiation should be reserved for glioma of both eyes. Patients with glioma of one eye ought to be operated upon and radiation be applied to the orbit to prevent relapses. From the observation that in an unsuspicious looking orbit the growth of the tumor in the depth undoubtedly progressed in spite of radiation, Jendralski considers primary radiation of one sided glioma as dangerous. Clinically and anatomically the cases showed that glioma is more or less radiosensitive. Axenfeld and Uhthoff saw fibrous alterations in the tumor and the affected retina. Even large doses of radiation had no deleterious influence on the growing brain of the children. In 2 patients, whose eyes were in the glaucomatous stage of the growing tumor, radiation reduced the intraocular pressure. This perhaps may be in connection, partly, with reaction of the tissues with hyperemia, partly with relaxation of the pressure of the growing tumor by drainage of the tumor cells.

Radiation of sarcoma, especially of the lids and orbit was not encouraging. The essential data of 7 cases are given. Relapse, spreading, metastasis could generally not be prevented in spite of most intense radiation of the area, freed by operation as much as possible from the tumor tissue. One patient died after a short duration of the disease, 4 were discharged with bad prognoses, and only 2 remained doubtful. Jendralski contends that it is not advisable to start with radiation, on account of the great tendency of growth that at first is an operable sarcoma, to be converted into an inoperable one.

In 11 cases, excepting one of carcinoma, the diseased parts were radically removed and, as soon as the wound permitted, it was treated with radiation. Thus in 2 cases relapses were prevented so far after as 4 and 3½ years. Corresponding to the experience of others, results can only be expected in a very superficial seat of the tumor. Postoperative radiation must begin very early. In inoperable carcinomas radiation may alleviate the distress of these unfortunate patients by influencing the growth and disintegration of the tumor, since no remedy is able to influence the cells of malignant tumors in a similar manner as radiotherapy, Jendralski recommends it in all cases.

Finally an angiomatous tumor of the upper lid of a child, aged 3, is mentioned in which radiation caused redness and ulceration of the skin, but subsidence of the tumor.

C. Z.

Dor. L. Antagonism Between Retinal Detachment and Posterior Sclero-choroiditis. Revista Cubana de Oft. v. 11, 1920, p. 100.

The author believes that there is some exaggeration in many cases on the part of some physicians concerning detachment of the retina in myopia. He considers that there is only danger in cases that do not have any choroidal complications, but when there are marked zones of choroidal ruptures, there is no danger of detachment of the retina. To illustrate this, Dor describes several cases, and affirms that detachment of the retina never occurs in myopic eyes with posterior sclero-choroiditis. He therefore recommends to myopes with extensive and numerous lesions of the fundus, to read and work, as there is no danger whatsoever of their having any detached retinae.

F. M. F.

Bruckner, A. Diseases of the Optic Nerve and Nasal Accessory Sinuses. Zent. f. d. ges. Ophth. u. i. Grenz. v. 3, 1920, p. 545-558.

This is a review of relations between retrobulbar neuritis and diseases of the accessory cavities. The author states that it is incomplete on account of the inaccessibility of non German literature. The first note of the above relationship is a note in Beer's textbook that "black Cataract" can appear following a suppressed cold without a perceptible appearance of mucus in the frontal sinus.

Frequency. The percentage of occurence is not exact, as the diagnosis is often only a probable one. According to different authors, the percentages of rhinogenous retrobulbar optic neuritis ranges from 3.5% to 17%. It is probable that the smaller number is nearer correct as some of the cases diagnosed as rhinogenous were probable cases of multiple sclerosis.

Pathogenesis. Most of the cases are caused by affections of the sphenoid or posterior ethmoid cells. When adenoids are considered the cause, the condition is probably the result of rhinologic association. The method of involvement of the nerve is not exactly known, but it probably arises thru a collateral inflammatory edema of sheath and possibly the nerve, which exerts a deleterious effect, either by its pressure or by the retention of the products of metabolism. It is possible that this is complicated by a transmission of the toxins along the lymph sheath of the vessels. If this lasts long enough, cellular infiltration, even migration of bacteria may take place.

Symptom Complex. There are two forms of rhinogenous neuritis, an acute and chronic. In the acute, the symptoms are very similar to those of cases due to sclerosis. Protrusion of the eyeball, slight dilatation of the pupil and pain on pressure on the ball or movement of the eye are either doubtful or not characteristic of rhinogenous affections. The disc may be normal or show a slight blurring. Later there may be a paleness of the temporal part of the whole disc, with a slight irregularity of the margins. The concentric contraction of the visual field is not as important as the central scotoma, usually relative, and increase in the size of the blind spot. This scotoma later becomes absolute and may increase to total blindness, the rapidity of this marking the difference between the acute and the chronic forms. As the condition improves, the last symptoms to appear are the first to disappear, so that there often remains an enlarged blind spot. The appearance of this symptom in this disease has been denied, and it is certainly not a constant one nor one found only in this disease.

Diagnosis. This is always very difficult, and often is only a probable one. It must be diagnosed from those cases due to multiple sclerosis, myelitis, toxic, hereditary, diabetic and those which are a part of an infectious multiple neuritis. The nose itself may give no aid, as it may appear normal. A prompt subsidence of the symptoms following endonasal treatment indicates a nasal origin.

Prognosis. This is uncertain on account of the uncertainty of the diagno-

sis. In general, the earlier the diagnosis and the prompter the treatment, the better the prognosis.

Therapy. Altho improvements may occur spontaneously or as the result of treatment of nonsurgical character, this is so doubtful that an operation should be performed as soon as the diagnosis is established. It should be performed also when there are good grounds for suspecting the cause to be in the cavities, even tho this cannot be proved.

C. L.

Baldino, S. Passage of Heterologous Sera from Blood Stream into Anterior Chamber. Archivio di Ottalmologia, v. 27, p. 77-83.

The author attempted to determine by anaphylactic reactions whether heterologous serum can pass from the blood stream into the anterior chamber. He did this by injecting beef serum into the anterior chamber of rabbits after having removed the aqueous, making, at the same time, deep scarifications on the posterior surface of the cornea. After two weeks, he injected the same serum intravenously into the rabbit, then removed the aqueous and made similar cuts on the posterior surface of the cornea. The second injection was followed by no more severe reaction than the first. To the author, this seems to prove that the serum did not pass into the anterior chamber from the general circulation after the second injection. He believes that the ciliary epithelium acts as a dialyzing membrane which allows only certain substances to pass and which keeps back the substance in the heterologous serum which produces anaphylaxis. This result is interesting in view of Guglianetti's apparent proof that an animal's own serum passes into the aqueous after paracentesis. Evidence of this he found in the fact that animals injected with this aqueous showed local and general anaphylaxis when injected after a sufficient period with the serum of the same animal from which the aqueous was obtained.

S. R. G.

Koeppe, L. Diffraction Grating Theory of Glaucomatous Rainbow Vision. Klin. M. f. Augenh. v. 65, 1920, p. 556.

The examination with the slit lamp with micrometric intravital measuring methods opened the way for an analysis of diffraction of the subjective phenomena of color of the living eye. After exposition of the different kinds of gratings in physical optics, Koeppe applies the grating theory to the structures of the refracting media of the eye in intravital observations with the slit lamp. Under normal and pathologic conditions, he distinguishes which is of especial differential diagnostic importance, in the following formations of subjective colored rings in the living ocular media:

(a) The precorneal or lacrimal Meyer's colored rings of from 1.25 to 2.50° angle radius in red. This phenomenon is found in conjunctivitis or slight irritation of the conjunctival sac, and in the presence of finely distributed ointment on the cornea. (b) The rings due to diffraction of the corneal corpuscles, which physiologically and in glaucomatous corneal stasis without inflammation have in red an angle radius of from 1.50 to 1.75 and seem to coincide with Meyer's rings. (c) The lenticular color rings frequently observed in normal eyes with medium sized and dilated pupils of from 3.5 to 4° radius in red, owing to radial grating of the living lens fibres. (d) The rings of from 5.5 to 8° in red in the preglaucomatous and glaucomatous attacks of increased tension without any inflammatory signs. These vitreous rings seem to be due to simple space grating of the vitreous structure which optically becomes more opaque by the increased tension, because the measuring of the diffraction constants of the grating of the vitreous approximately corresponds to the distance relations of the filtrations of the vitreous.

Hence Koeppe urges, in patients who complain of seeing colored rings, the measuring on Igersheimer's disc

the angle radius of the rings, for the differential diagnosis of true from spurious glaucomatous colored rings.

C. Z.

Bachstez, E. Anatomy and Origin of Socalled Evulsion of Optic Nerve. Klin. M. f. Augenh. v. 65, 1920, p. 827.

Bachstez examined a boy, aged 15, who was accidentally shot with a revolver in the left temple, with exit in the right temporal region. After 2 weeks amaurosis with normal appearance of the eyes. Ophthalmoscopically, R. a hole at the site of the optic nerve, surrounded by white foci and hemorrhages. L. secondary atrophy of disc, hemorrhages, white foci and pigment changes at the macula. The patient died from meningitis 4 weeks after the injury. Autopsy: The white foci proved to be due to necrosis of the retina. The lamina cribrosa was torn all around from the wall of the scleral canal and with the head of the optic nerve dislocated 1 mm. backward within the dural sheath.

A synopsis of the anatomic changes in the cases recorded in literature shows that 2 types of injuries must be distinguished. In type 1, the optic nerve with its dural sheath is torn from the posterior pole of the eyeball which is easily explained by a very intense trauma.

Bachstez's case belonged to type 2, in which the dural sheath remains intact. Its explanation is more difficult. Bachstez points out the diversity of injuries of this type, and the great number of explanations given in the literature. He concludes that in most cases of this kind it is not logical to speak of an evulsion of the optic nerve, but much more correct to designate it as an atypical rupture of the sclera in the area of the lamina cribrosa, caused by sudden rise of intraocular pressure by the impact. He discusses the supposed mechanism in detail.

C. Z.

Rumbaur, W. Histology of Iritis and Congenital Lues. Klin. M. f. Augenh. v. 66, 1921, p. 61.

Rumbaur adds a new case to the 4 cases, histologically described, of primary iritis in congenital lues, in a girl, aged 24 days. Both eyes were moderately irritated, diffuse opacities of both corneas, iris dirty grey and hyperemic, in the left some small yellowish greyish mass in pupillary area, anterior chamber shallow, tension increased. Iridectomy. No inflammatory symptoms of eyes after 13 days. The right eye remained well, but new exudations and adhesions occurred in the left eye with subsequent hydrophthalmus. The excised pieces of iris showed diffuse chronic inflammatory infiltration of the whole tissue with lymphocytes and plasma cells, and transition into cicatricial sclerosis, without essential involvement of the blood vessels. All the other cases showed this lack of vascular changes, which is an important difference from the acquired lues. As the vascular system is the tissue of the human body which has the most active function, Rumbaur thinks the less used up vessels of young children are more resistent to the invasion of the luetic virus.

C. Z.

Huber, O. Inflammatory Pseudotumor of Orbit. Klin. M. f. Augenh. v. 65, 1920, p. 718.

A soldier, aged 20, who for 11 months worked very hard in dusty rooms, as war prisoner in France, noticed in June, 1917, sudden failure of the sight of his left eye with severe pain. He then was interned in Switzerland and, on July 6, 1918, came to Huber V. = 0. The eye deviated downward and to the temporal side. The finger could not be introduced between bone and the exophthalmic eyeball, but felt a strong, little elastic resistance. Media clear, immense choked disc of 9 D, i. e. 3 mm., slight peripapillar edema, no hemorrhages. General examination negative. K. I. had no effect. Exenteration of orbit on July 9. The orbital tissue consisted of

coarse fibrillar tissue, with scanty vessels and cells, scattered plasma cells and lymphocytes, at some places conglomerated to heaps, similar to lymph follicles. The choroid was hyperemic, the disc edematous, veins enlarged, small perivascular infiltrations of the sclera near the disc with plasma cells and lymphocytes. Diagnosis: Chronic retrobulbar inflammation. Examination of the blood showed slight increase of erythrocytes and white blood corpuscles.

On August 27, the patient commenced to complain of headache on the right side. The right disc was very hyperemic and showed 4 D., refraction difference from the macula. Under iodin, mercury, quinin and arsenic, the condition in the orbit was the same. The patient was then repatriated and has not been heard from since.

Huber recommends in all doubtful cases of this kind internal treatment with arsenic and antiluetics, especially K. I. However, one must consider that after exenteration of one orbit, the other may become affected in the same way in spite of energetic general treatment. C. Z.

Rochon-Duvigneaud. Simple and Double Foveae in Retina of Birds. Ann. d'Ocul. v. 157, 1920, p. 673-680.

There are 3 types of birds: (1) those with a single fovea, almost central, whose optic axes make an angle of about 120° in birds with small beaks, and an angle of more than 120° in those with a large beak; (2) those with a double fovea, one of which has a position corresponding to the preceding, while the other is posterior and inferior to it. They are separated from each other by a distance which is proportional to the diameter of the retinal sphere. These are diurnal birds of prey, which have large heads and optic angles often less than 120°; (3) those with a single fovea lying lateral or posterior. These are the nocturnal birds of prey. In these, the optic axes make an angle of 90°.

In mammals, e. g. the cat, where the optic axes angle is about 95°, an illumination of one eye will cause some contraction of the pupil of the other protected eye, proving that there exists a binocular vision. But in the third class, in spite of the smaller angle, illumination of one eye has no effect upon the pupil of the other, showing the independence of the eyes. This independence is probably due to the relation of the visual axes. In birds with lateral eyes, whether the fovea is single or double, there is no position of the head where they will meet. In the nocturnal, predaceous birds, where the foveae are eccentric, there is likewise no meeting point of the visual axes, and consequently no binocular vision. C. L.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orelans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu. Volunteers are needed in other localities.

DEATHS

Dr. J. W. Chamberlain, St. Paul, Minn., aged 64, died June 15th.

Dr Richard Kalish, New York, died June 21st from heart disease, aged 67 years.

Dr. Alfred D. Sawyer, Fort Fairfield, Me., died June 20th from cancer, aged 66 years.

D. J. Paes de Carvalho Sobrinho, a rising ophthalmologist of Rio de Janeiro, died recently, aged 34.

Dr. C. Herman Thomas, Philadelphia, died June 28th, 1921, aged 82.

PERSONALS

Dr. Arnold Knapp of New York City, sailed for Europe July 16.

Dr. Burton Chance, of Philadelphia, is spending a few weeks in Europe.

Dr. Eldridge Adams, formerly of Trinidad, Colorado, has removed to San Antonio, Texas.

Professor W. Uhthoff retires this year from the chair of ophthalmology, of Breslau, having reached the age limit.

The honorary degree of Doctor of Laws has been conferred upon Dr. Freeland Fergus by the University of Glasgow.

A Christie Reid, D. O., has been appointed Surgeon to Nottingham Eye Infirmary, vice Col. H. Herbert resigned.

Dr. Wm. H. Crisp, Denver, is making a two months automobile tour in the East, having extended it as far as Portland, Maine.

Doctors Tribble, Black and Nims announce the formation of a clinical group. They are located in the Thompson building, Hot Springs National Park, Arkansas.

Col. Henry Smith of India was a San Francisco visitor during July. Doctor Smith gave a very interesting talk before the San Francisco County Medical Society on his personal experiences in medicine and surgery.

Dr. Geo. H. Woodruff, who was graduated from the medical department of the University of Illinois in 1920, is now serving an internship in St. Luke's Hospital, Chicago, in the eye, ear, nose and throat department. Dr. Woodruff is the son of Dr. Harry W. Woodruff of Joliet, Illinois.

Dr. F. S. Owen, Professor of Ophthalmology, University of Nebraska, spent a very pleasant and profitable vacation in the Hawaiian Islands. He recommends very highly a trip to the islands as a sure cure for that tired, run down feeling.

Dr. Homer E. Smith, the originator of the Smith-American operation for immature cataract, was one of the prize winners in the contest for the best essays on "Group Diagnosis" instituted by the New York Diagnostic Society.

Dr. John W. Thompson returned recently to Pueblo, Colorado, from Philadelphia, where he has been doing clinical work on ear, nose and throat the past year. He will resume practice in association with his brother Dr. Henry M. Thompson. The latter will continue as heretofore, to limit his practice to ophthalmology.

SOCIETIES

At the annual meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, the following were elected to serve as officers for 1921: Chairman, Dr. G. Oram Ring; Secretary, Dr. C. R. Heed; Executive Committee, Dr. H. F. Hansell, Dr. W. T. Shoemaker and Dr. G. E. de Schweinitz.

MISCELLANEOUS

Under the will of Mrs. Ellen V. D. Hazelton of New York, the New York Eye and Ear Infirmary was bequeathed the sum of $10,000.

A marble bust of Prof E. Fuchs, Vienna, was unveiled June 14; the occasion being his 70th birthday. He retired from active practice in 1915.

The Catholic Archdiocese of New York has purchased two four-story brown stone houses in East Seventy-ninth street, for $65,000, to be used as a home for blind children.

A large statue of Donders, the Holland ophthalmologist and physiologist, was recently unveiled at Utrecht, where he had

been Professor of Ophthalmology until his death in 1889.

J. E. McDaniel, found dead in a gas filled room in his home in El Paso, July sixth, left a will in which he bequeathed all the money he had after paying funeral expenses to the Kansas School for the Blind—about $500. McDaniel was formerly a switchman at Kansas City.

The Trunk Line Association has granted to the fellows of the American Academy of Ophthalmology and Oto-Laryngology, an extension of time on the purchase of return tickets at half fare rates, from October 26th, as previously announced, to November 1st, 1921, providing three hundred and fifty tickets are purchased on the Certificate Plan.

Can sight be restored by the process of transplanting a normal eye in place of a blind one? Medical circles in Vienna, according to newspaper reports, are discussing this question as the result of a lecture recently delivered there, at which the claim was made that experiments carried out have proved sight can be thus restored.

Any oculist comtemplating a visit to the Hawaiian Islands is requested to communicate with Room 44, Alexander Young Building, Honolulu, for any information desired; also to call at the above mentioned room upon arrival at Honolulu. Honolulu is the place to get rid of that "tired feeling." The finest serfing in the world with the thermometer around 80 F, the trade winds blowing a gentle breeze and everybody as happy as a lark.

EDUCATIONAL

On the occasion of his "Fortieth Class Reunion" from the Medical Department of the University of Michigan, Dr. John E. Weeks of New York established a scholarship for research work in ophthalmology to be known as the "John E. Weeks' Scholarship Fund for Research Work in Ophthalmology." This scholarship is to be open to graduates or undergraduate students with the understanding that research work carried on in this scholarship should be under the direction of the Professor of Ophthalmology in the University of Michigan. The beneficiary may receive the award one or two years in succession as the committee may decide but no one is to receive the award more than twice.